The Refrigeration Service Engineer

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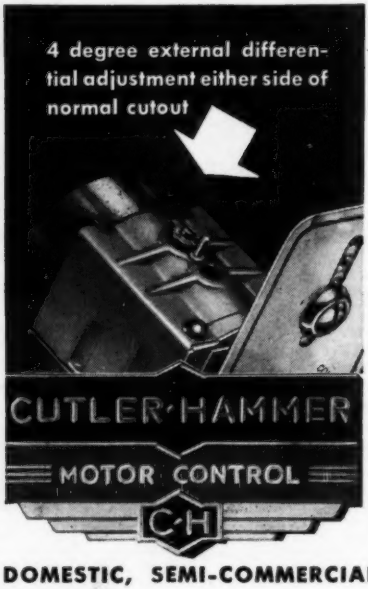

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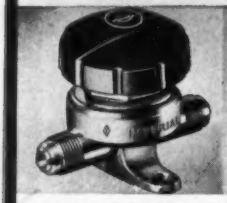

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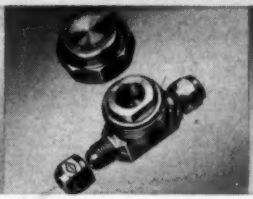

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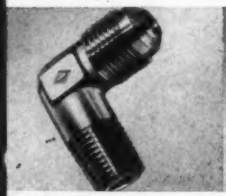

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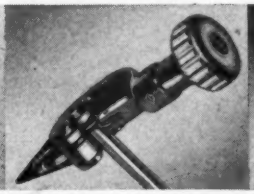

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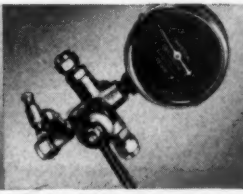

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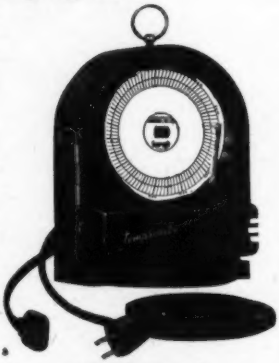

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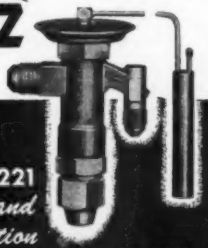

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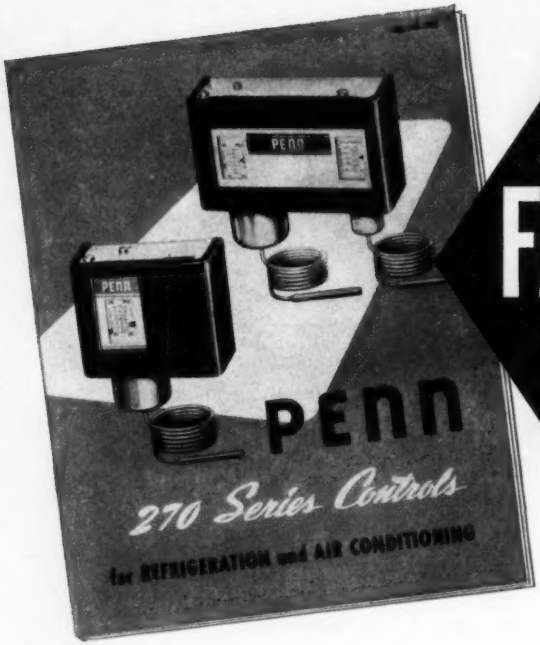

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Bulletin No. 2652

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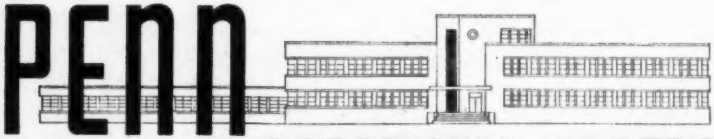

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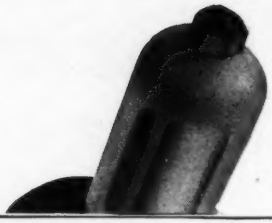

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« IN THIS ISSUE »

THERE are still quite a large number of the old ammonia systems in ice plants, ice cream and dairy plants and in various other industrial concerns that are manually operated, thus requiring continuous attention by an operating engineer. These plants can be modernized and made more efficient by the installation of automatic motor controls; the replacement of flat belts with V belts; and the replacement of hand expansion valves with high side floats or thermostatic expansion valves. Edward Dowis describes how it can be done in his article "Installing Automatic Controls for Commercial and Industrial Systems," on page 29.

IN HIS article this month, appearing under the heading "Take the Guess Out of Estimating" on page 33, Donald F. Daly discusses the full coverage labor and material type of service contract. The experiences of two West Coast concerns with this work, together with service contract forms and an idea of monthly rates charged for the work, make this article highly informative and useful.

ELAPSED time "From Tool Box Toter to Head of a $250,000 Business" has been established as 10 years by the owner of a Toledo service company, but one must travel fast to do it. How it was done is told in the story appearing on page 38.

ONE of the greatest difficulties in applying ultra violet radiation to refrigerated areas is maintaining comparatively high tube surface temperatures (at which the greatest efficiency is obtained) in a much lower temperature area. How it has been accomplished by one concern is told in the story appearing on page 40.

UNDER the Service Pointers department this month, page 43, appears a well illustrated story on how to construct a very handy portable bench made of pipe and scrap pieces of steel. It is designed for use on the customer's premises during construction or extensive repair work.

THE Questions and Answers section, page 45, contains a question, "Can cold controls freeze out?" The answer of course is "yes" and the explanation is given following the question.

ALL interest is centered on Cleveland this month—site of the RSES Annual Convention and the All-Industry Refrigeration and Air Conditioning Exhibition. Beginning on page 47 and continuing on the pages following, is a complete time-table of events, programs of meetings, directory of exhibitors and descriptive stories on what to expect at the meeting.

THE California Institute of Technology was host to the Los Angeles Chapter of RSES recently, where the membership in addition to an inspection tour of the institute, were taken on an illustrated verbal "Excursion into the Desert of Events" by Dr. Goetz. Judging from the report given on page 70, it must have been a highly educational tour.

THE amount of refrigerant contained in that cylinder you carry around in your service truck is of the utmost importance to your welfare and it is for this reason that P. B. Reed, RSES International Educational Director, undertook the investigation of filling densities recommended by ICC. His findings and recommendations are contained in a letter appearing on page 80.

AMONG the "New and Improved Equipment," page 94, is a very convenient drill press clamp which will make drilling operations on small parts faster and safer.

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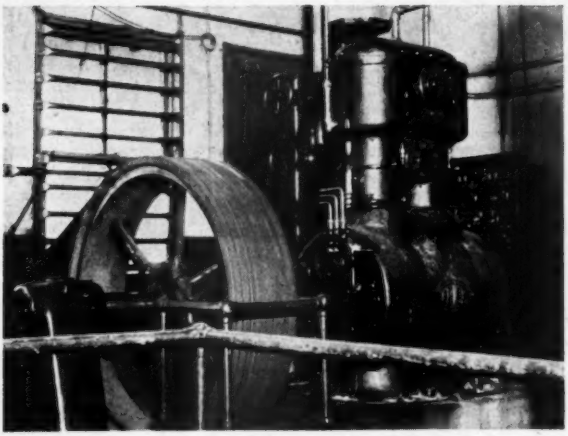


Machines like this 9 x 9 Frick Ammonia Compressor, when manually operated, are good prospects for automatic control. There are many older type ammonia machines still operating without automatic control.

Installing Automatic Control For Commercial and Industrial Systems

By EDWARD DOWIS

Automatic operation, long considered essential to domestic and commercial low-pressure systems, is being adapted to industrial plants of all sizes. Changing manual systems to automatic operation is a profitable, non-seasonal field for service engineers.

MOST of us who have spent our time installing and servicing low pressure refrigerating equipment are unaware of the very large number of manually operated plants, mostly ammonia, in dairies, packing houses, hotels, apartments, skating rinks, etc. which could go for a good modernization job including provision for automatic operation. Moreover, many of the owners and operators of this equipment do not know that it can be so equipped or the advantages to be gained by automatic control. Many service engineers hesitate to undertake work of this kind because they are not sure of the proper procedure and precautions to be observed in order to insure safe operation.

Basically, the problem of installing automatic controls on an ammonia system is similar to a low pressure system of comparable size. Thermostatic controls are usually employed to start and stop the compressor motors so it may not be necessary to disturb the ammonia system at all. A HIGH PRESSURE CUT-OUT SWITCH SHOULD ALWAYS BE INCLUDED to stop the compressor before the pressure rises above safe limits. This provision is usually built into manual systems and needs only to be carried over to automatic.

Use Equipment Suitable to Refrigerant

Pressure switches and piping suitable for Freon, methyl, sulphur or other low pressure systems are usually unsuitable for ammonia. This is due chiefly to the corrosive effect of ammonia and moisture usually found in practice, on copper and its alloys. Only devices specifically made for ammonia should be used in direct contact with this refrig-

erant. Copper or brass tubing or pipe should not be used. Except for the high pressure cut-out switch, usually already installed, it is often not necessary to disturb the ammonia system at all, in converting to automatic operation.

Control equipment usually required for automatic operation, some of which will be also included in the manual systems, includes:

1. Magnetic motor starting switch.
2. Switch or switches for selecting on, off or automatic cycles at will.
3. Manual switch for stopping in emergency.
4. High pressure cut-off switch.
5. Thermostat.

Motor Starting Switch

If the manual system is equipped with a magnetic motor starting switch which operates properly, the conversion should be simple. If a hand starter is used, it must be replaced with an automatic type.

A.C. motors are usually started at full voltage, directly across the line. Some of the older and larger types have to be started at reduced voltage in order to prevent excessive starting current and line disturbance. These will require an automatic compensator which will supply reduced voltage until the motor comes up to speed and then throw it directly across the line.

Synchronous motors used in some of the very large compressors require special starting equipment as they require direct current for field excitation and have to be brought into correct phase relationship with the line current before being connected to the line.

Electrical manufacturers, through their jobbers, can supply automatic equipment for operation of practically every type of motor. Where large equipment is required, the cost of replacing with latest design matched motor and starter should be considered. When trade in or sale value of present equipment is deducted, the cost may be no more than starting equipment for the old motor.

Direct Current Motors

Direct current motors, except fractional h.p., can not be started across the line, but must have a resistance in the armature circuit while coming up to speed. Two types of automatic starters are available. Both of these gradually cut out resistance until the motor comes to full speed. The contactors are operated by electromagnets or solenoids. The definite time delay type has an oil or air dashpot or a clockwork escapement which definitely times the operation. The counter E.M.F. starter has the operating coil connected with the armature of the motor so that it cuts out resistance only as the armature accelerates, building up a counter E.M.F. Both of these are connected to the control devices in a similar manner. Wiring diagrams illustrate both types. Where the motor can be promptly brought up to speed under all conditions with the hand starter, a definite time delay automatic starter should be satisfactory. Where different load conditions require different periods of time in bringing it up to speed, a counter E.M.F. automatic starter should be used.

On-Off Automatic Switches

On many low-pressure systems, no provision is made for manual operation as it was designed to be completely automatic. It is well, on larger plants, to provide a switch or switches with which the operator can stop, start or put the system under automatic control at will. Special switches are made for this purpose or two single pole switches can be used as shown on the diagrams.

Manual Switches

The National Electric code and most state and local codes require that a switch capable of interrupting the current in all ungrounded conductors be connected in each motor circuit and located within sight of the motor. This is to permit the motor to be stopped, should all automatic equipment fail. A standard enclosed safety switch is suitable for this purpose and, if it contains the motor fuses, should be rated at a capacity sufficient to handle the starting current as well as running. This requirement should be observed in all systems, except that motors of ¼ h.p. or less may have, as the disconnecting means, an approved receptacle and cord plug.

Pressure Switches

A high pressure cutout should be part of every refrigerating system and should be set to cut off the motor before the pressure reaches the pressure relief valve settings either from system to atmosphere or from

high to low side, as such a relief valve is included in many compressors. Ammonia pressure switches are usually of the diaphragm type or steel bourdon tube actuating device and are available for either high or low pressure application. Piping is usually of extra heavy iron with weld, screw or

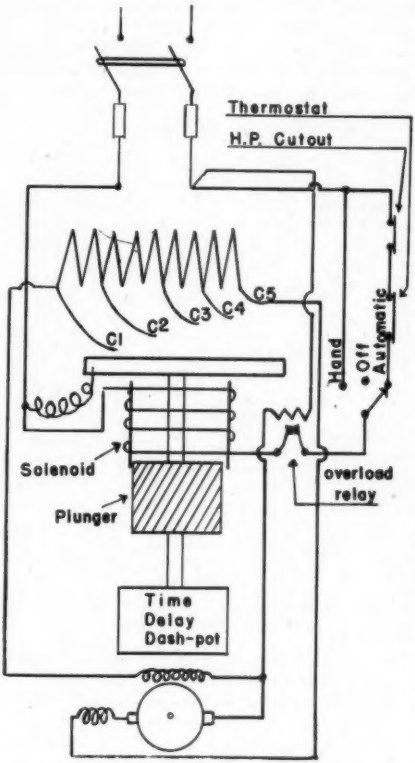


Fig. 1—Diagram of definite time delay starter for DC motors.

flange union fittings made for ammonia. Copper or brass pipe or fittings must never be used, nor should devices made for other refrigerants. When operating motors through automatic starters, the ampere rating needs only to be that necessary to energize the starter magnet; usually a fraction of an ampere. The voltage rating should be line voltage.

There is no essential difference between thermostatic controls used in ammonia, carbon dioxide or low pressure systems. Because they operate to close or open electrical circuits in response to temperature changes, the only specifications necessary are dependability, adjustability to range and differential required and correct voltage and current requirements.

Drives

Power is transmitted from the motor to compressor through a common shaft, a hydraulic or speed reduction device or coupling, a flat belt or a V-belt drive. Due to the tendency of many flat belt drives to throw the belts off motor pulleys when starting under load, it is usually advisable to replace flat belt drives with V-belt. This makes a more compact unit. It is not necessary to cut sheaves in the fly wheel of the compressor as there will be ample surface on the flat rim. This surface is increased by bringing the motor near to the compressor. A V-belt pulley will be necessary on the motor.

Accessories

Various devices may be used to smooth out the various operations and reduce starting load, among which are solenoid or electrically operated valves which should be secured for the refrigerant used. Relays may be used to start motors in sequence or prevent their starting at the same time. They may also be used where it is desired to operate the control circuit at a different voltage from that of the motors or to operate alarms for high pressure, low water, etc. or to stop the compressors under such conditions. Centrifugal switches may be used on brine pumps to stop compressors should brine pumps fail.

Electrical Connections

Fig. 1 shows the connections to a typical definite time delay D.C. motor starter with a Hand-Off-Automatic switch, a high pressure cutout and thermostat. When the control circuit is closed the solenoid coil is energized raising the plunger, the action being slowed down by the dashpot. As the contactor closes the main circuit successively through contacts C1 to C5 the motor is started with all resistance in the armature circuit. As the motor comes up to speed, resistance is cut out until when the plunger has reached the top of its travel, the resistance is all cut out. When the hand switch is turned to OFF, the motor will be stopped,

regardless of control settings, and when turned to HAND, it will run continuously until turned to OFF. A thermostatic or magnetic overload relay is usually part of the starter, and connected as shown.

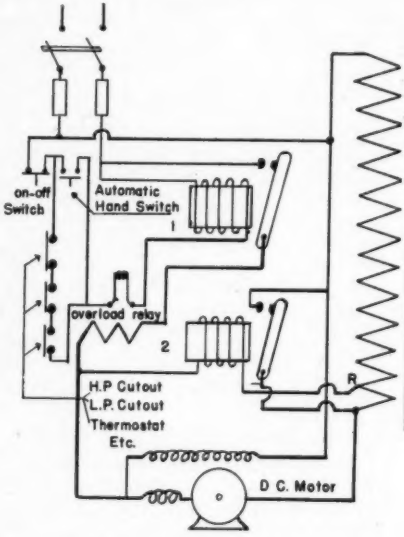


Fig. 2—Diagram of two-step counter E.M.F. starter.

Fig. 2 shows a starter which will not cut out armature resistance until the motor comes up to speed, regardless of the time it takes. Only two stages are shown, but any number may be used. This circuit shows two single pole switches used to select hand, automatic or off positions. Any number of pressure or temperature controls or other devices may be connected in the series circuit. When the control circuit is closed, coil 1 of a relay is closed, completing the main circuit through overload relay coil, the series field and armature, in parallel with the shunt field, with resistance in series with the armature circuit. Relay coil 2 is connected across the armature, series field and a small part of the resistance. It will not close until sufficient counter voltage is set up in the armature as it comes up to speed. The speed at which it will close can be regulated by changing the point R, at which the coil is connected to the resistance.

The control circuits in the various types of A.C. controllers are usually similar to that illustrated in Fig. 3. These controllers are usually constructed with four contactors, three of which are used for three phase, two for single; four may be used for two phase or special control circuits. When only two line wires are used, as in single phase circuits, it is common practice to connect contactors 1 and 2 in parallel and also 3 and 4, and using each pair for a line. In this type of controller, as soon as the various control devices close the control circuit, without delayed action, the coil is energized, causing the motor to be thrown directly across the line.

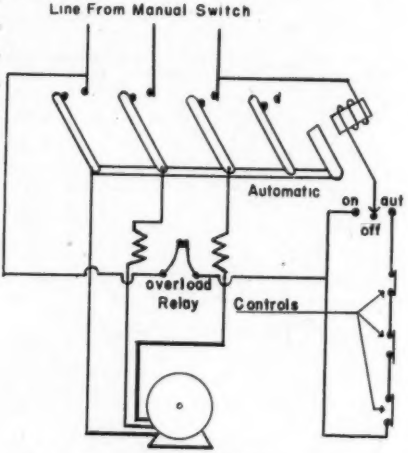


Fig. 3—Diagram of three-phase motor controlled through across-the-line starter.

The most apparent advantage of automatic over manual control is the release of the operator for other duties about the plant. At night, it may run unattended. A more important advantage is that maximum efficiency and more satisfactory results can be obtained with automatic control.

The starting and stopping of compressors used to chill brine, as in ice plants, skating rinks, etc. is usually controlled by the brine temperature. Two compressors are usually installed on systems with variable loads, one to handle the light, and both the heavy load, as when a skating rink is being hardened, or immediately after ice has been harvested and water replaced in the cans in an ice making plant. This can be accomplished automatically, simply by setting the thermostat or low pressure control for each motor so that only one will be running at lowest temperature and the other one cut in as soon as the load increases.

By DONALD F. DALY

LABOR AND MATERIAL MONTHLY COMMERCIAL CONTRACTS

THERE are almost as many ideas about contract service as there are contractors engaged in such work. Each operator has to work out a plan that meets the conditions in his own locality and there is no single formula that can be applied in every case. But by presenting a number of plans that have been used successfully it should be possible for any contractor to select those features in each plan that seem to apply to his particular situation.

Lee McNew of McNew's Incorporated, 816 Castro Street, Hayward, California, has a clearer understanding of the problems involved in such work than most of the men interviewed on this subject. His service contracts cover both labor and material and were written after careful study of the requirements of such contracts. He has a file of job records running into the thousands and the charge rates are based on his average cost for service as shown in these records.

An old hand at the refrigeration service business, Mr. McNew has given contract service a lot of thought and I believe that his ideas on this subject will prove interesting and helpful to any contractor who is planning to engage in this work.

"We enter into these contracts," says Mr. McNew, "with the idea that the contract service client will have first call on our services. The most important thing in contract service is the relationship between the service contractor and the client. Anyone who enters this work with the idea in mind that he can slight his contract service customers is foredoomed to failure. It might be possible to slight the casual customer and get away with it, but the contract client must be given prompt and efficient service at all times. If the contractor is not prepared to render such service he might just as well forget about such work.

"The contractor should exercise much care in taking on contract service clients," Mr. McNew went on. "First of all, don't sign up a client who has a lot of run down equipment. You'll lose your shirt and your reputation, too, if you do. It is best to limit your service contracts to those equipment owners who have fairly modern units, and have made it a point to keep their equipment in good repair. The next most important point is the personality of the person you expect to enter into a contract with. If you have been doing service work for a man, and find that he is reasonable in his demands, you will probably find that your relationship under a service contract will be satisfactory. However, if you find a man to be exacting, unreasonable, and difficult to get along with in your casual dealings, you had better pass him up as a contract service prospect.

Tenth Article

Last month the author discussed monthly inspection contracts, recommending them as the best type of service contract. In this article, the full coverage contract is discussed, including the story of one company's experience with this type of service.

"One of the biggest troubles in contract service," said Mr. McNew, "is that the customer does not understand just what service he has a right to expect under his contract. This is due in part to the fact that the contractor, in his anxiety to get the customer's name on the dotted line, failed to make clear the extent, and the limitations, of the contract. For this reason we prefer the type of contract which covers both labor and material. With such a contract the burden of responsibility rests squarely on the contractor's shoulders, and as long as the customer makes his payments in advance, he has the right to demand full and complete satisfaction from the contractor."

One incident in which a customer and a contractor could not come to an understanding of the terms of a service con-

SERVICE CONTRACT

Articles of agreement made this ..... day of ....., 19....., between McNEW'S INC., Hayward, Calif., and .....

of .....

McNEW'S INC. promise and agree for the consideration hereinafter mentioned to inspect periodically and repair the equipment listed on the back of this contract.

McNEW'S INC. promise and agree to perform the services in a good and workmanlike manner and furnish and provide good and sufficient materials necessary for the said repairs for a period of One (1) year, commencing....., 194.....

And for and in consideration of services performed by McNEW'S INC. said .... hereby promises and agrees to pay said McNEW'S INC. the sum of $..... per month, payable every three months in advance.

The only exception to the above is burnt out motors caused by low voltage, poor wiring or other causes beyond McNEW'S INC. control in which case McNEW'S INC. will make a charge equal to the amount actually paid for rewinding the motor.

McNEW'S INC.

..... By.....

By..... .....

....

CONTRACT SERVICE RATES

	Labor Only	Parts & Labor
1/4 H.P. unit	$3.00	$5.00
1/3 H.P. unit	3.00	5.50
1/2 H.P. unit	3.50	6.75
3/4 H.P. unit	4.00	7.50
1 H.P. unit	4.50	8.75
1½ H.P. unit	5.00	10.50
2 H.P. unit	5.50	11.50

McNew's Inc. Service Contract shown above is a very simple, understandable form with a minimum of confusing legal terms. The contract rates included were set up after careful study and much experience resulting from several thousand job record cards.

tract was graphically illustrated by an experience related by Mr. McNew. McNew's Incorporated had service contracts with a chain store organization which covered four stores and more than one hundred pieces of equipment. Their relationship with this customer was pleasant and profitable in most respects, but they could not come to an understanding as to just what was covered by the service contracts. Finally, by mutual agreement, the contracts were terminated.

The termination of these contracts did not mean the end of their business dealings. Shortly after this occurrence Mr. McNew was offered a position by this firm to act as their construction superintendent, and in an advisory capacity in matters pertaining to the refrigeration equipment. At that time this company was expanding its facilities and they needed a practical man to take charge of the installation work. Mr. McNew turned the running of his own business over to Jim Sodeman, executive vice president of McNew's Incorporated, and went on the payroll of this organization.

This arrangement lasted until most of the new equipment was installed, and the changes in the existing equipment had been made. When Mr. McNew went back to his own business he was given first call on the service work of this firm. Which was natural enough, since he, and his mechanics, were very familiar with the installations. They did not, however, enter into another service contract. The work is done on a labor and material basis, and a very fine account it is, too. "Actually," said Mr. McNew, "the work is not costing this company any more than it did under the service contracts. But this arrangement does give both parties greater freedom of action."

Contracts Give You an "In"

This experience bears out statements that have been made repeatedly in this series—that the greatest value the service contract can have is to give the contractor an "in." Of course, after he gets this "in," he is strictly on his own. One thing seems obvious—the average service contractor is not smarter than the business men he has dealings with. If he were, their positions would be reversed. All of which makes one wonder why service contractors will try to put something over on their customers. But they do. Just talk to any equipment owner.

McNew's Incorporated now holds twenty-three service contracts, covering about one hundred and twenty pieces of equipment. The charge rates shown in the contract form used by McNew's Incorporated were set up after careful study and much research. They have a file of several thousand job record cards which they have accumulated over a period of twelve years. The average costs for service on small and medium commercial units, as shown by these record cards, forms the basis of the charge rates.

Their assumption is—that a refrigeration unit will have to be completely replaced over a period of five years. The charge rates for labor and material are shown as separate items on the form and the customer can sign up for either, or both, services. As an example of how the material charge rate works out—the material charge rate for a ½ hp. unit is $3.25 per month. In 1941 a good ½ hp. unit cost about $200.00 (list price). Figuring a monthly charge rate for material of $3.25, we get 60 months at $3.25 per month, for a total of $195.00. This total seems to bear out the fact that the charge rates used by McNew's Incorporated are based on pretty sound facts.

"We have used contract service to good advantage in the past," said Mr. McNew, "and we shall continue to use it. But in my opinion contract service would work out better if the contractor went in for that type of work exclusively. He could then devote his entire organization to this work and would not be torn between his desire to take on additional work, and at the same time keep his contract service clients happy."

Contract Service on Ammonia Plants

Another form of contract service that is being used by Emergency Ammonia Service Company, Pier 52, San Francisco, California, was outlined to me by L. C. Smith, general manager of that concern. Mr. Smith's organization does a lot of ammonia installation work in Northern California. Much of it in small towns. In the course of this work they have become known to equipment owners in those areas as experts on ammonia service and installation. Since many small towns cannot support a full-time ammonia service contractor, these equipment owners naturally turned to an organization that was known to them.

"When calls for service from these outlying towns first started coming in," said Mr. Smith, "some of them from as far as 300 miles away, we found that it disrupted our local organization to send men out on them and we were very reluctant to take on such work. But the calls kept coming in, and we finally set up a separate department to take care of this work. A special truck was fitted out and equipped with all of the tools required in ammonia work. We assigned our best trouble shooter to the work.

REFRIGERATION MAINTENANCE CONTRACT

This contract made in triplicate, this.....day of.....

19....., by and between REFRIGERATION MAINTENANCE CORPORATION, hereinafter called the Seller, and.....hereinafter called the Purchaser.

DESCRIPTION OF EQUIPMENT:.....

.....

LOCATION OF EQUIPMENT:.....

.....

THE SELLER AGREES:

1. To make such adjustments to operating refrigeration equipment which in seller's judgment are necessary for the most efficient operation of equipment.
2. To furnish to said equipment required service labor, and materials which in its judgment are required for proper operation, for the term of this contract from.....19..... until cancelled by either party upon thirty days written notice to the other.
3. To answer calls for service as promptly as possible.
4. To make a service or inspection call at least once every six months, which will include checking, adjusting, cleaning, and oiling of equipment.

THE PURCHASER AGREES:

5. To pay to the Seller the sum of.....Dollars ($.....)
   upon signing of this contract, and the sum of.....Dollars ($.....)
   on the.....day of each and every month thereafter as long as this contract shall remain in force.
6. To make a reasonable effort to eliminate unnecessary calls by prior inspection of the equipment.
7. In the event that repairs are necessitated by other than normal operation and use, such as may be occasioned by Acts of God, fire, theft, accidents, freezing, rupturing of submerged or water cooled coils or condensers, wilful damage or abuse, to have repairs made promptly, and to pay as an extra for any labor or material required in making such repairs.

IT IS FURTHER AGREED THAT:

8. Repairs required to cabinets, hardware, or similar accessories are not covered by this contract.
9. The Seller shall not be responsible for any changes or repairs required by City, State or Federal Government, for any repairs or material furnished by any one other than the Seller, nor for any delays caused by strikes or other causes beyond its control.
10. The Seller may cancel this contract immediately and without notice in the event of delinquency in payment by the Purchaser.

By: REFRIGERATION MAINTENANCE CORPORATION Purchaser.....

By:..... By:.....
Name and Title

Title:..... Telephone:.....

REFRIGERATION MAINTENANCE CORPORATION

S. M. No.....S. M.....Monthly Pay.....Account No.....

The above is another simple type of service contract used by a large mid-West service company. It covers a complete labor and material service except for conditions stated under item (7), considered beyond the control of the contractor.

"The question of charge rates caused a lot of trouble. It costs money to send a man out of town for a long trip and most customers don't like to spend money. On the other hand, we couldn't afford to handle this business if we couldn't show a profit on it. We worked out a zone arrangement, with a schedule of charges for each zone.

"We based our charges for such service on the assumption that we would have to make an average of two calls per month to each plant during the four or five months of the summer season. No attempt was made to sell the service on a yearly basis. The charges cover labor only. The customer could buy his own parts, or we would supply them at list prices."

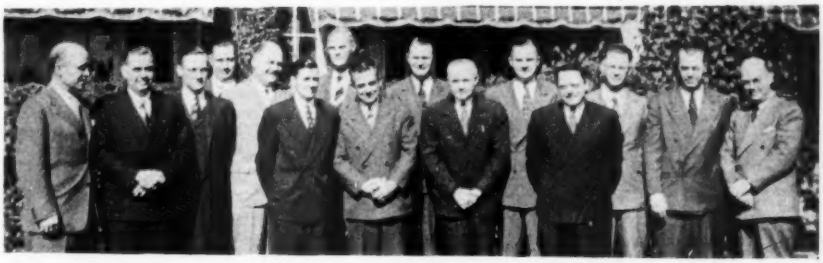
The charge rates were set up as follows: Emergency Ammonia Repair Company's regular charge rate for labor is $3.50 per hour. The first zone is limited to 25 miles and they charge two hours labor for each call, which means that the customer pays $7.00 per call, or $14.00 per month. This seems a reasonable figure, and it is, as long as the customer is in the first couple of zones, but when they are in the 200 or 300 mile zone, the cost really mounts up. The table gives a schedule of charges for all zones.

"The same charge rate was used regardless of the size of the plant," said Mr. Smith. "We now have thirty contracts covering forty-two plants. These plants range in size from 20 hp. to 60 hp. If we have to make more than two calls per month we take a loss. However, we have found that we just about average out. We lose on one, but make it up on another. Actually these thirty owners form a sort of insurance pool.

"We have never used a conventional service contract," Mr. Smith went on. "Each of these plants is an individual problem and we draw up a memorandum covering the terms of the service contract for each individual plant. In my opinion contract service forms don't mean very much. Either party can break the contracts by giving notice in writing thirty days in advance. It has been our experience that service contracts are not very binding. The real test of a contract agreement, written or verbal, is that both the customer and the contractor are satisfied with the arrangement. If either party is not satisfied, it is always best to dissolve the contract by mutual, and if possible, friendly agreement."

Charge rate based on two calls per month. No mileage is charged.

25 mile zone—four hours labor	$ 14.00
50 mile zone—eight hours labor	28.00
100 miles zone—sixteen hours labor	56.00
200 mile zone—twenty four hours labor	84.00
300 mile zone—thirty-two hours labor	112.00



INDUSTRY JOINT COMMITTEE ON STANDARDS FOR OPEN-TYPE UNITS MEET

Pictured are members of the Joint Industry Committee working on minimum standards for open type condensing units. They are, left to right: Mark E. Mooney, Product Manager, Carrier Corp.; Frank K. Smith, Chairman, Sales Manager, Refrigeration Division, Tecumseh Products Co.; Alfred D. Sullivan, Chief Engineer, Brunner Mfg. Co.; George Davis, Lynch Manufacturing Co.; Oscar Buchman, Vice-President and Chief Engineer, Copeland Refrigeration Corp.; Leonard C. Bastian, Recording Secretary, A.C.R.M.A. office; Lars Hanson, Director, Reciprocating Refrigeration Div., Carrier Corp.; W. E. Landmesser, Vice-Chairman, Manager Resale Sales, York Corp.; Ted Benson, Frigidaire Division, General Motors Corp.; J. L. Gibson, Frigidaire Division, General Motors Corp.; Carl Ehrenhardt, General Electric Co.; A. B. Newton, Chief Engineer, Elec. Refrig. & Air Conditioning Division, Chrysler Corporation; George R. Kingston, Manager, Commercial Product Development Division, Kelvinator Corporation; Clyde Plaeger, Servel; Henry A. Brysselbout, Chief Engineer, York Corporation.

From Tool Box Toter to Head of a $250,000 Business

IT'S a long jump from the position of an independent refrigeration service man who carries a tool box in one hand and a dinner bucket in the other—to the head of a business that runs well over a quarter-million dollar business a year.

But that is the story of F. A. George—an independent refrigeration service man who has really gone to town during the past ten years or so.

Today he has one of the largest service organizations in northwestern Ohio—servicing all makes, all models, of electric refrigerators, ranges, water heaters and laundry equipment.

Mr. George, himself, took the factory training service course at Frigidaire, Dayton, Ohio, about sixteen years ago.

From there he went on his own—servicing household and commercial refrigeration jobs—not only Frigidaire—but all kinds of refrigeration equipment, obsolete models, "or-

In these views of the F. A. George Company (1) is an exterior view of the quarters at 18th and Adams Streets, Toledo—the entire building occupied and owned by the company.

Inside will be found (2) this section of the display room featuring major household appliances — refrigerators, ranges, laundry equipment, hot water heaters and (3) this section of the display room which features commercial refrigeration equipment.

The F. A. George organization (4) consists of 22 servicemen, 3 salesmen, and an office staff.

F. A. George, owner of company.

phans," "clunkers"—or what have you.

When he organized his own company in 1935, he assumed full responsibility for training his own salesmen and service men. Training covers service on all major items of appliances (radios excluded). Training meetings are held regularly, once a month, with Mr. George presiding.

As an independent service man heading a service organization, Mr. George for several years held contracts with the larger department stores covering installation and service. In recent years, however, this factor of the business has been discontinued.

Today's more important service contracts (replacing, and more importantly) cover—through connections with large industrial contractors—most of the big hotels and industrial plants throughout the city.

Gradually growing from a miniature unit consisting of himself and a helper, the F. A. George service organization has—through the past several years—expanded into an outfit of 22 service men and 3 salesmen.

During this time, F. A. George had also been appointed as a full-fledged Frigidaire dealer—an authorized (and one of the largest) dealer for the entire Frigidaire line of appliances in Toledo and Lucas County and also commercial refrigeration equipment dealer for Wood County, Ohio.

Now owning his own building at the corner of 18th Street and Adams, Toledo, Mr. George is installing air conditioning for his display room and various offices.

In the F. A. George organization are seven members of R.S.E.S. including William Foster, President of the Toledo Chapter of R.S.E.S. and also John Horvath, Vice-President of the Toledo Chapter.

ASRE ISSUES BROCHURE ON PSYCHROMETRY

A VALUABLE addition to literature on psychrometry has just been made available by The American Society of Refrigerating Engineers—"ASRE Brochure on Psychrometry." This booklet, preprinted from the 1948 Sixth Edition Basic Volume of the Refrigerating Data Book, includes data which will simplify engineering calculations in psychrometry.

There are three complete psychrometric charts covering the low, normal and high-temperature ranges. The new charts are extremely easy and convenient to use as they give precise results through the use of enthalpy deviation lines drawn directly on the chart. In addition, it is easy to make the adjustments for rejected or added moisture when this refinement is desired.

Adequate tables are included which make it possible to adapt the charts for solving problems when the barometer or altitude deviates from standard. The very complete psychrometric tables on the thermodynamic properties of air and steam, which are included, were prepared by Professor C. O. Mackey of Cornell University; the brochure was written by E. P. Palmatier of Carrier Corp., and D. D. Wile when he was associated with Carrier.

Copies may be obtained from ASRE headquarters, 40 West 40th Street, New York City, for $1 each.

Brine Brochure Is 40th Publication

THE two common refrigeration brines, calcium chloride and sodium chloride (salt), are authoritatively discussed in an Application Data Section recently published by The American Society of Refrigerating Engineers. Author of the five page brochure is R. H. Sawens, director of technical service, The Solvey Process Company.

Designated Application Data 40, the brochure presents in nontechnical language the properties, preparation, and corrosion characteristics, of these two widely used brines. In addition, the AD discusses corrosion inhibitors, brine testing, and the correction for acidity or alkalinity.

This Application Data Section is one of 40 similar publications prepared under the direction of the ASRE which cover all phases of refrigerating engineering. It may be obtained from ASRE headquarters, 40 West 40th Street, New York City, for 30 cents a copy.

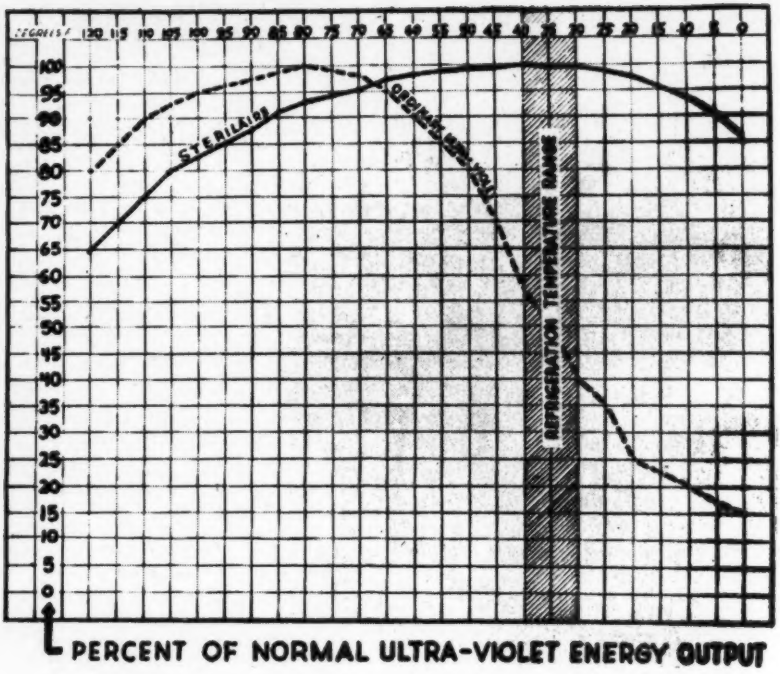


Fig. 1—Chart showing room temperature and its effect on ultra-violet efficiency.

Ultra-Violet Radiation made practical for the Food dealer

By J. L. GOODSON*

MOLD-PREVENTION is a primary consideration for anyone handling foods, especially meats. Ultra-violet radiation prevents the mold which usually starts at temperatures below 38 F. in the presence of high humidities! It also prevents slime, usually present when box temperatures get above 40 F. with high humidity. By preventing mold and slime, ultra-violet light materially reduces trim losses, and even the "trim" from ultra-violet irradiated meat can be sold as ground meat.

The use of ultra-violet light in walk-in refrigerators was just beginning to catch meat dealers attention when the war came along and interrupted the development of this germicidal device. During the past ten years, however, much information about the use of ultra-violet germicidal lamps has reached the butchers, hotel, restaurant and locker operators, and packers. They recognize this protection today.

Their interest is understandable, of course, for in these days of extreme high prices for meat, and rising labor and supply costs, it requires real ingenuity to keep their operations in the black. Naturally they react favorably to a program that eliminates mold

* Sales Manager, Ultra Violet Products, Inc., Los Angeles, Calif.

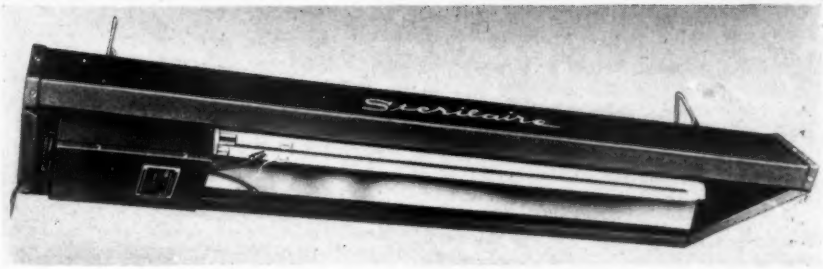


Fig. 2—The Sterilaire ultra-violet unit.

and slime, and consequent losses from trimming, that enables them to provide their customers with tastier meat because they have not drawn out the original juices by dehydration, and more tender meat, too, because with ultra-violet protection the enzymes in the meat are more active at higher box temperature and are tearing down the tissues.

All of us, as consumers, are also interested because each ounce of meat saved means that much less pressure on the supply of this food item that is rapidly becoming a luxury. When all the excess verbiage about business conditions are swept aside, most of us subscribe to the theory that prices are the result of the balance between supply and demand.

As is true with many new products, high claims have been made for ultra-violet light. And in most instances these claims have been true. But a strict adherence to fundamentals has not always been the order of the day. For instance, it is true that ultra-violet light will kill air-borne and surface bacteria. But it is also true that cold temperatures reduce the efficiency and life of unprotected germicidal tubes. It follows, therefore, that special attention should be given to the problem of using ultra-violet light in temperatures of 30 F. to 40 F.

It is generally known that the maximum efficiency of ultra-violet tubes is reached when the room temperature is about 80 F. Not so well known is the fact that the temperature at the tube wall must be about 100 F. in order for the tube to generate the bactericidal wave length (2537 Angstrom units) at its peak efficiency.

The basic problem of efficiently adapting ultra-violet protection to refrigerated areas can therefore be stated—"How can maximum efficiency be attained when the temperature at the wall of an ultra-violet tube must be 100 F. in a meat box that must be kept at 35 to 40 F.?"

The fact that this problem existed was the reason why the Sterilaire ultra-violet lamp was developed. Ultra Violet Products Inc., put to work their fifteen years of experience in building ultra-violet lights, and step by step developed a lamp that would operate at its best in a room temperature of 35 to 40 F.

The first improvement was the construction of a hair-pin type of tube, in an effort to counteract loss of efficiency by using more tubing, with a greater amount of ultra-violet light emanating from a single lamp. That helped, but it was only the beginning.

Next a reflector of spectral finish aluminum was provided, which has the best reflection qualities for ultra-violet light. It was important, because it helped to throw back into the box a maximum amount of the ultra-violet rays. At the same time it was a factor in building the required temperature around the tube.

A third improvement was the use of a hood, or housing, in the shape of an inverted trough. As all refrigeration men know, warm air rises, and the object of this inverted trough-shaped housing is to catch and hold the warmth that is generated by the burning of the tube. Since a cold cathode type of U-V lamp does not produce much warmth, it is important to conserve every bit possible, and of course prevent unnecessary warmth from the general area of the box. Warmth is needed, but only around the tube. This idea proved most helpful and of course was incorporated into the design of the lamp.

Another thought was suggested by the simple observation that all refrigeration uses insulating materials. In applying this thought to the lamp, a covering of water impervious insulating board was placed around the walls of the lamp housing. Of course this helped materially in attaining

the final objective of 100 F. around the germicidal tube.

But the problem was not fully solved, so further efforts were expended. In the final step the crowning achievement was the introduction of a tube temperature control system, designed to give all the extra warmth needed. It was developed by the use of a high resistance nichrome wire wound around the entire length of the hairpin tube. Seven watts are passed through the wire, and this was just the amount needed to secure the final objective. The entire lamp consumes only 55 watts.

The net results of these experiments provided what was needed. A thermometer placed behind the tube as the lamp is burning in a refrigerator will give a reading of close to 100 F. But placed just outside the lamp housing, the thermometer reads 85 to 40 F., the same as in any other part of the box.

This is the story of the development of a specialty product. It is a story that has been told many times in the annals of American business. It is the story of the competitive but free way of life in these United States. It is also the story of the beginning of most businesses that have grown big and prosperous in our country.

Where Lamp Is Needed.

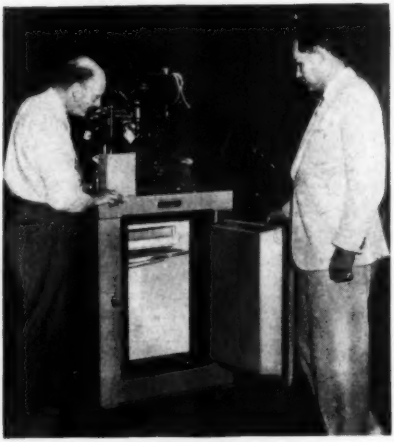
Concerns holding large quantities of meat over longer periods of time are most interested in these lamps. For instance, wholesale jobbers are interested because they have to purchase an inventory of processed meat products, and must anticipate the markets and the needs of their customers. Many times this necessity places them in a position where they are overstocked with perishable meat, and they stand to lose a large share of it in shrinkage and trimming because of actual spoilage. Wholesale jobbers often operate with old refrigeration equipment, or many times rent this equipment from cold storage houses and market houses. Also, some wholesalers "age" meat for particular customers. When they do, ultra-violet has a very special application in their business.

Locker plants usually "age" the meat somewhat before freezing. This procedure is called "holding cooler operation." Furthermore electronic air disinfection is new and an important factor in the clean atmosphere required in such places.

Hotel supply houses generally handle top grade meat, which grade is made better by "aging." Aging time can be reduced and the good results from higher temperatures can be secured economically with the installation of ultra-violet lamps.

Hotel and restaurants emphasize the quality and taste of their meats, and therefore are interested in methods of improving their food.

Fish are very perishable, and usually objectionable odors are associated with fish markets. Bacteria on fish are quite prevalent. Objectionable odor can be eliminated immediately, and further and more important, spoilage will be reduced and the fish will get to the consumer in better condition, if ultra-violet is used.



EXPLORERS TO USE MOBILE REFRIGERATORS IN JUNGLE AND DESERT EXPEDITION

William K. Carpenter, noted explorer and naturalist of Wilmington, Delaware, is shown above (right) inspecting the specially built gasoline powered mobile refrigerator just completed for the Philadelphia Academy of Natural Sciences expedition this winter to the Equatorial African jungles and the Liberian Desert. Two of these refrigerators will be used by the expedition this winter when they photograph and collect rare fish, birds, and animals. The refrigeration units were built by Wilson Refrigeration, Inc., Smyrna, Del., and A. A. Davis, vice-president of the company (left), is shown explaining to Explorer Carpenter that the refrigerator will hold a 50 degree temperature for four or five hours after the power is shut off. Mr. Carpenter, with Harold Green, curator of the Academy's museum, will head the expedition. The refrigerators will be used to protect the expedition's precious color film from the intense heat and moisture of the tropics.

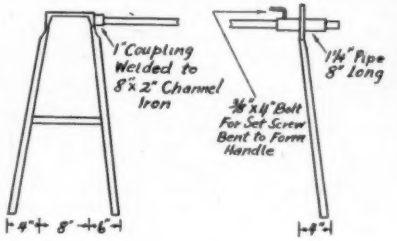
SERVICE POINTERS

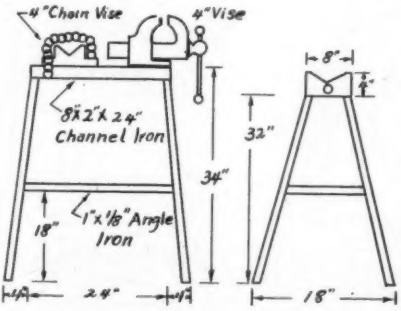
A department for the exchange of ideas on new devices and methods of improving service work. Five dollars is paid for each pointer published. Write up your idea today and mail it to the Service Pointer Editor.

HANDY PORTABLE VISE BENCH

LOW many times, while you were on an installation job, have you wished for a machinist's vise to hold something that you couldn't get in a standard pipe vise.

The accompanying drawing illustrates how you can build a sturdy vise bench in your own shop from inexpensive materials, which will give you a pipe vise and a bench vise on these small jobs, but also is so portable it can be handled by one man.

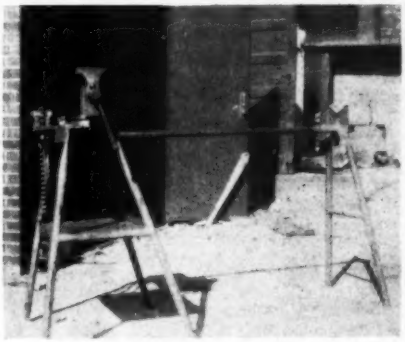




Materials for this stand are one piece 8" by 2" channel iron 24" long; one piece ⅜" by 4" by 8" flat iron; 4 feet 1" by 1" by ⅛" angle iron; one piece 1¼" black pipe 8" long; one ⅜" by 4" or longer bolt (for set screw see drawing); approximately 18 feet black iron pipe; 4" (light) machinist's vise and one 4" capacity chain pipe vise.

Cutting the Material

First cut six pieces 1" pipe 36" long, flatten one end to ⅜" thick back about 4" by heating and hammering. Next cut a hole, the center 1½" from edge at center of ⅜" plate to receive 1¼" pipe, in opposite edge cut a vee 4" wide and 1" deep. If you desire to drill the holes to bolt down the vises in the drill press, you should next mark the holes for vises and drill in the 8" by 2" channel iron. Weld 1" steel pipe coupling on the outside of web opposite pipe vise to be used to attach auxiliary stand. Now you are ready to assemble your vise stand by welding the flattened ends of four pipe legs to the edge of web of channel iron, flush with ends at angles shown on drawing. Next cut 1" angle iron to brace these legs and also support a wooden shelf. Next weld two legs to edge of ⅜" plate opposite vee, also a 1" pipe brace between legs about half way up. Then weld the piece of 1¼" pipe in hole in ⅜" plate with one-half extending each way. This piece of pipe is drilled and tapped 2" from one end as shown in drawing. This auxiliary stand is used to support long pipe



The finished bench in use.

while cutting and threading. It is attached by slipping piece of 1" pipe of desired length through 1¼" pipe guide and screwed into coupling on main stand.

Block the completed and assembled stand up level and mark the lower end of legs approximately 34" from top of 8" channel and cut off.

Now you have a tool with a hundred uses. *Submitted by—Cecil R. Visger, Kansas City, Mo.*

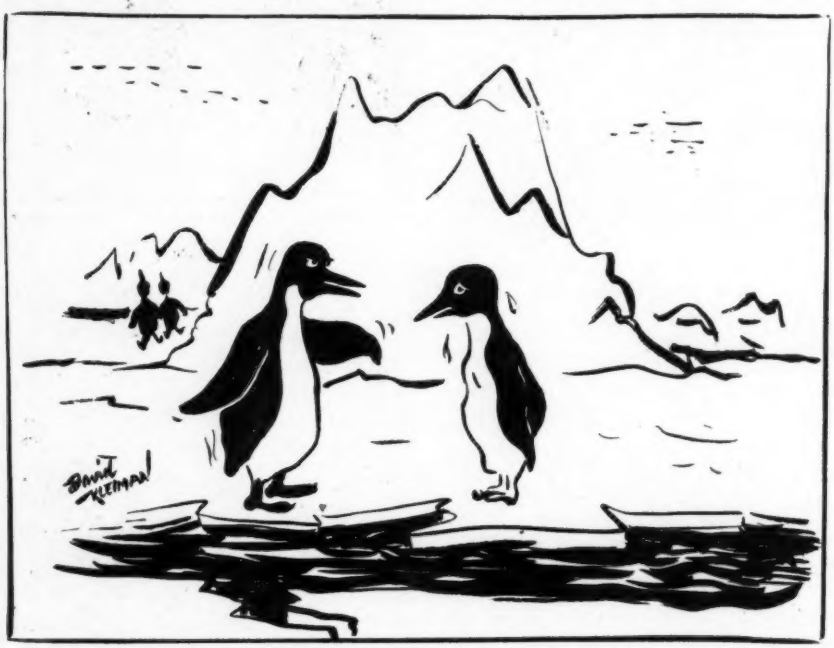
PROTECT BULB FROM BRINE

BEING a reader of your section on Service Pointers, I want to say that I think it's a very essential part of THE REFRIGERATION SERVICE ENGINEER.

I have a suggestion which came to me as a result of a brine tank installation. When installing a thermostatic expansion valve on a brine tank coil or anywhere that it might be splashed with brine, I've found it a good idea to paint the power bulb and tube with emulsified asphalt or some other good brine resisting solution. It is important, however, that this is done after the power bulb has been securely clamped on the suction line, otherwise the bulb may be insulated from the suction line. The reason for this practice is the danger of the brine eating away the tube and causing a loss of the power charge in the valve.—*Submitted by John S. Rochat, Cleveland, Ohio.*

REDUCE SPEED FOR LOW VOLTAGE

I HAVE run into refrigerators where the voltage was not too good and the motors had a hard time picking up the load and getting enough speed to switch to the running windings though compressor turned easily and head pressure was OK. I put on a different motor pulley generally ½" smaller. This will give the motor enough advantage to get its speed and handle the load. Of course the unit will run a little longer because of the reduced speed but that is better than taking the chance of damaging the motor.—*Submitted by H. K. Danielson, Parkston, So. Dakota.*



"LET'S NOT HAVE ANY MORE TALK! I'M DEFINITELY GOING TO THE ALL-INDUSTRY EXPOSITION IN CLEVELAND!"

QUESTIONS AND ANSWERS

Send Your Servicing and Installation Problems to the Question Box.

COCA COLA COOLER RUNS HOT

QUESTION 817: In servicing coolers for Coca Cola, I serviced one with the following trouble: The first day the filter was plugged with moisture, so I put on a new dryer. The following day the head pressure reached 175 lbs. In checking over, I found the new dryer plugged with the dirt I have enclosed in the envelope. I would like to know what this substance is and why the first dryer did not catch it.

Could you also tell me what the head pressure should be if the temperature of the air blast coming off the condenser of the unit is 120 degrees? This unit is a ¼ hp. Mills with 2 lbs. Freon, thermostatic expansion valve. This Mills unit is about six years old. The original motor is a ¼ hp.

While the head pressure is around 125 lbs., this motor will operate all right, but not if the head pressure goes higher. If I purge the unit to lower the head pressure, the evaporator will not frost all the way. To make it frost all the way, I add gas and the motor stalls, runs hot, and eventually burns out. We have wondered why this should happen after so many years. Seemingly this only happens when the weather is hot.

As a temporary measure I have installed a ⅓ hp. motor and this seems to work all right. We are wondering why this should be necessary after six years. I would appreciate any help you may be able to give me.

ANSWER: We forwarded your sample of sludge to Dr. Walker of the Ansul Chemical Company and his analysis reads as follows:

"This is almost pure iron rust which means that it gives a very good chemical test for iron and in addition, only a slight one for copper. There is a slight test for chloride which would indicate that the sludge was in the machine for quite a long time. As a normal thing, sludges which are due to moisture, as this one is, if of short duration show a very high chloride test and little, if any, test for iron rust. The fact that this sludge consists primarily of iron rust indicates that it has been in the machine for some time. Probably the reason the first drier did not catch the sludge is that it was not stirred up and carried to the drier unit.

"As indicated above, the origin of this sludge is moisture and there isn't very much a service man can do except remove it by means of a filter as it comes to the locations where it may cause trouble. If this sludge is too extensive in character an overhauling job might be indicated later on in the event it caused trouble in the compressor."

I think Dr. Walker's letter answers very thoroughly your questions on the sludge and leaves no doubt that your trouble originates with moisture in the system. Perhaps this will also be a lead to your other trouble wherein you are unable to obtain a proper balanced condition without excessive head pressures. It is quite possible that moisture in the system has caused carbon deposits in the condenser which in turn acts as an insulating blanket decreasing the efficiency of the condenser.

If the air going over the condenser is at 120 degrees, the head pressure of the unit would be in the neighborhood of 157 pounds.

FREEZING COLD CONTROL

QUESTION 818: The following question came up the other night at a local Service Engineers Meeting.

Domestic cold control freezing out and becoming inoperative. Do you have any data or information to substantiate this question? From what I can gather one of the large operators here has been changing controls quite frequently and telling their customers the above. The control in question was put out by Ranco.

I ran across a job the other day where control had been changed by this company and gave the housewife the above, that control was freezing out. What I cannot understand is the control taken off was operating this box for the past ten years and suddenly froze.

My way of thinking about this question runs along the same as this housewife—that she was being gypped in a roundabout way.

ANSWER: Some time before the war, many controls were mounted on the evaporator shield, and several times they were mounted so close to the evaporator that unless the evaporator was defrosted frequently, frost and ice could build out until it not only

touched, but almost surrounded the control. In many of these cases the ice would freeze into the control to such an extent that the control would become inoperative.

In one case, the manufacturer of a domestic refrigerator found it necessary to supply a sort of rubber sleeve to cover a portion of the control as a service part to correct a condition of this kind. There have been other cases where it was necessary to have holes in the lower side of the control to drain out the water that would not condense in the control by reason of portions of it being in contact with the ice and getting too cold.

BATTERY TEST BOX

QUESTION 819: I would appreciate information regarding a box for testing automobile batteries.

The box dimensions are: length 6'6", width 3'2", depth 3'7". These are outside dimensions. Insulated with 5" of cork board on the sides and bottom, with 2" cork board on the lid. The capacity of the box is 20 six-volt fully charged batteries. They will enter the box at 95 degrees F, and be removed at 0 degrees F. The 0 degree temperature is the acid temperature within the batteries. The time for lowering the acid temperature, 16 hours.

I would like to use cold plates at one end of the box, with a squirrel cage fan for air circulation. How many square feet of Dole plates would you recommend? What air velocity? Also what size condensing unit, the average room temperature being 85 degrees?

ANSWER: Replying to your inquiry regarding recommendations for plates in test box for cooling storage batteries, we suggest setting up the job as follows:

Insulation and service load figures 20,400 Btu. per 24 hours. Test load is difficult to figure as we have no data on overall specific heat of batteries. Accordingly we add 50% to above load as a generous allowance and obtain 30,600 Btu. Dividing by 18 for 18 hour operation gives 1700 Btu. which would be compressor capacity at about minus 20 refrigerant. We then suggest six plates 22" x 30" totalling 55 square feet of surface. These would be arranged in bank with 22" dimension vertical and 30" dimension horizontal. Plates would be placed on 2" centers allowing 1¼" in the clear between plates. Air velocity of 150 to 200 feet a minute should supply good circulation if batteries are stacked properly for circulation over them.

Plates may be connected in series, entering bottom of first plate, leaving top of first plate to bottom of second plate and continuing in this manner. Plates should be in rust-proof finish due to presence of acid fumes.

DRYING AN SO_2 SYSTEM

QUESTION 820: I have two 1½ hp. sulphur jobs which drew in a lot of moisture in a low side, and now are clogging up strainers nearly once a week. What would be the best to use in the dryer to get the acid out of the system?

ANSWER: The best and cheapest method of removing moisture and contamination from the sulphur dioxide systems you describe is to discharge all the refrigerant, change the oil in the compressor and wash it with carbon tetrachloride, blow out the refrigerant lines and the coils with high pressure gas or CO_2, pump a vacuum on the system and heat all parts as much as possible with a torch; then recharge with new refrigerant.

It is true that sulphur dioxide can be dried with one of the drying agents found on the market, and through drying you will remove the acid contained in the system at present. The drying process, however, is rather lengthy and quite difficult to produce satisfactory results and in the meantime the condition in the compressor due to corrosion from the moisture is becoming rapidly worse.

If you intend making an attempt to dry the system through the ordinary methods, I would suggest that you use one of the advertised drying agents, using about a 4-mesh size, and installing the dryer in the suction line. In doing this you will to some degree protect the compressor from moisture, which will return with the return gas and thus possibly avoid a stuck-up compressor. Furthermore, according to data we have on hand on the subject, it is claimed that a better job of drying on sulphur dioxide can be obtained by treating the gas in its vapor stage.

I would install the dryer as described above, then pump down the system to zero pounds pressure and apply heat with a blow torch to all sections of the coil so that any moisture contained in the coil or any ice formation will be removed and picked up by the dehydrator.

It would possibly be advantageous to pull a low vacuum on the coil while this heating is going on so that the vaporized moisture will be pulled through the dryer. After you have completed this operation it will probably be well to remove the dryer and renew or reactivate the drying agent, then replace.

CLEVELAND · *Host to the Industry*

WHO THEY ARE • WHERE THEY MEET

Headquarters
Hollenden Hotel

JANUARY 21
THROUGH
JANUARY 24

Headquarters
Hotel Cleveland

Sponsor—
All-Industry
Refrigeration &
Air Conditioning
Exhibit

JANUARY 26-29

Headquarters
Hotel Statler

JANUARY 26-27

Headquarters—Hotel Allerton

JANUARY 25-27

NATIONAL COMMERCIAL
REFRIGERATOR SALES ASSN.

Headquarters—Hotel Carter

JANUARY 27-28

TIME TABLE OF ACTIVITIES

Wednesday, January 21 to Saturday, January 24

Refrigeration Service Engineers Society Meeting

See Schedule, Page 48

MONDAY, JANUARY 26

8:00 a.m.—Registration, Refrigeration Equipment Wholesalers Association—Hotel Statler.

9:30 a.m.—Annual meeting, president's report and speakers, National Association of Refrigeration Contractors—Hotel Allerton.

10:00 a.m.—Preview of All-Industry Exposition, Public Auditorium, exclusively for wholesalers.

12:30 p.m.—Press Luncheon Meeting, National Association of Refrigeration Contractors—Hotel Allerton.

2:00 p.m.—All-Industry Exposition (Open to entire industry to 10:00 p.m.).

TUESDAY, JANUARY 27

9:00 a.m.—Meeting, Drinking Water Cooler Manufacturers Assn. (Division of Refrigeration Equipment Manufacturers Assn.).

9:30 a.m.—Annual meeting, with speakers, committee reports and election of directors, National Association of Refrigeration Contractors—Hotel Allerton.

10:00 a.m.—13th Annual Meeting, Refrigeration Equipment Wholesalers Association—Hotel Statler.

12 noon—All-Industry Exposition (For Refrigeration Contractors, Dealers, and Service Engineers only. Open to 6:00 p.m.).

7:00 p.m.—Cocktail Party & Annual Banquet, Refrigeration Equipment Wholesalers Association—Hotel Statler.

7:30 p.m.—Annual Banquet, National Commercial Refrigerator Sales Association—Grand Ballroom, Hotel Carter.

WEDNESDAY, JANUARY 28

10:00 a.m.—Regional Meetings, Refrigeration Equipment Wholesalers Association—Hotel Statler.

12 noon—All-Industry Exposition (Open to 6 p.m. to entire Industry).

2:00 p.m.—Annual Business Meeting and Election of Officers, National Commercial Refrigerator Sales Association.

7:30 p.m.—5th All-Industry Exposition Banquet, Arena Floor—Public Auditorium (Continuous entertainment to 1:00 a.m.).

THURSDAY, JANUARY 29

10:00 a.m.—All-Industry Exposition (Open to 4:00 p.m. to entire Industry).

All Roads Lead to CLEVELAND *Says* RSES

REFRIGERATION SERVICE ENGINEERS SOCIETY

HOTEL HOLLENDEN • JAN. 21.22.23.24

MEETING in Cleveland, Ohio, for its 10th Annual Convention, the Refrigeration Service Engineers Society returns to the city for the second successive year. Cleveland Chapter, as hosts during the last convention, is now supplemented by the young but vigorous Buckeye State Association whose membership are acting as hosts to visiting members and guests in making this meeting the most successful held.

Committees have been active for months in arranging plans for visiting members and Cleveland awaits the surge of service engineers who will descend upon the city for this event.

The Convention of the Society will be held on Wednesday, Thursday, Friday and Saturday, January 21, 22, 23, and 24. Sunday will give visitors an opportunity to see Cleveland prior to the opening of the All Industry Refrigeration and Air Conditioning Exhibition in the Cleveland Auditorium, Monday, January 26. The exhibition will be open to the industry from 2:00 to 10:00 P.M. Tuesday the exhibition is open from 12:00 noon to 6:00 P.M. for service engineers, contractors, and dealers only.

Hollenden Hotel Is RSES Headquarters

The Hollenden Hotel is the official headquarters for the Society. Educational sessions and entertainment functions will be held in the Grand Ballroom of the hotel. The hotel is conveniently located to the center of Cleveland and closest to the Cleveland Auditorium.

Schedule of RSES Meetings

Wednesday, January 21

9:30 A.M.—Registration
2:00 P.M.—Convention called to order
Reports of officers
Committee Reports
Appointment of Convention Committees
7:30 P.M.—Get-together party and dinner

Thursday, January 22

9:00 A.M.—Registration
9:30 A.M.—Information Please
10:30 A.M.—Educational Session
2:00 P.M.—Trips to Plants

Friday, January 23

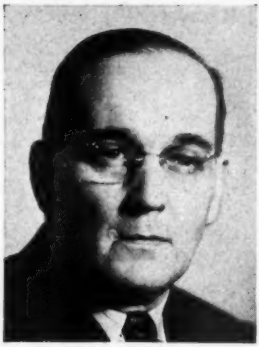
9:30 A.M.—Information Please
10:30 A.M. to 5:00 P.M.—Educational Session
7:30 P.M.—Annual Dinner Dance

Saturday, January 24

9:30 A.M.—Information Please
Reports of Convention Committees
New Business
Election of Officers
Adjournment

Bring Your Refrigeration Problems

The warm-up session—Information Please—opening each morning's educational session provides an opportunity of getting answers from "experts" on those "hard-to-crack" problems. Because of the interest in these



W. W. ALLISON, Los Angeles
President

W. J. MARSHALL, Leaside, Ont.
1st Vice President

C. C. E. HARRIS, Cambridge
2nd Vice President

Information Please sessions, more time has been allotted at this convention for this interesting and valuable feature. So bring your tough service problems with you and get the benefit of a wealth of practical and technical experience.

Educational Conference Speakers

Speakers representing authorities in their field of activity have been selected to provide the convention with the latest information on the subjects they will discuss. The International Educational and Examining Board in assigning the topics for discussion have taken into consideration the requests as indicated on a questionnaire mailed to Chapters several months ago. This preference represented a cross section opinion of Chapter members as to subjects they were primarily interested in.

Speakers and the subjects they will discuss include:

Refrigeration of Fresh Meats—J. H. Spence, Service Manager, Hussman Refrigeration, St. Louis.

Leak Detection—George H. Clark, Director, Detroit Air Conditioning Institute, Detroit.

Two and Three Stage Systems—Tom Lopiccola, Bowser Co., New York.

Solids in Refrigeration System—Dr. W. O. Walker, Director of Research, Ansul Chemical Co., Marinette, Wisconsin.

Truck Refrigeration—A. F. Sawyer, Engineer, Dole Refrigerating Co., Chicago.

Safety in Refrigeration Service—George

C. J. DOYLE, Omaha
Treasurer

H. T. McDERMOTT, Chicago
Secretary

J. L. DRISKELL, Burley, Idaho
Sgt.-at-Arms

The Seven Members of RSES International Board of Directors

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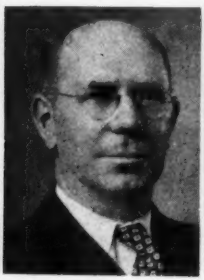


C. S. TUCKER
Birmingham, Ala.

PAUL B. REED
Chairman International
Educational Committee

Schuld, Sr., Refrigeration Engineer, Cleveland.

Evaporative Condensers and Cooling Towers—A. M. Fenwick, Refrigeration Consultant, Cleveland.

Reverse Cycle Refrigeration—Paul B. Reed, Perfex Corporation, Milwaukee.

Entertainment Features

The annual entertainment events of the International Convention provide the necessary relaxation after a busy educational and business session. Past annual entertainment features are pleasant memories for those who have attended these affairs. This years events will be no exception.

On Wednesday evening, the first day of the Convention, a big-get-together party and dinner will be the feature. "Top-notch' entertainment following the dinner will provide a fitting climax to the first days session.

Friday night is the big annual banquet followed by dancing. The local entertainment committee has planned these events to make the lighter side of the convention activities a pleasant experience for you.

Tours to Plants

Thursday afternoon has been reserved for visits to manufacturing plants. As certain plants have only limited capacity for visitors tours, tickets will be allocated in the order received. When you register, it will be advisable to indicate the tour you desire.

About Registration Fees

For *members,* tickets for the big Wednesday and Friday dinner and entertainment events will be $10.00 per person, which will include registration fee. A nominal registration fee of one dollar will be charged for *members* who will attend the educational and business sessions only without the entertainment events.

For *guests,* tickets for the two entertainment features will be $15.00 per person. A

non-member desiring to attend the educational sessions only, will pay a nominal registration fee of two dollars.

The Ladies Are Expected

The ladies are an important part of RSES Conventions. The Cleveland Ladies Committee are arranging for their entertainment during the Convention. The Auxiliary will hold their annual convention and all ladies whether auxiliary members or not are cordially welcomed to participate in the entertainment program planned.

Registration Badge

Your registration badge is not only your admittance to the RSES meetings, but will admit you to the All Industry Refrigeration and Air Conditioning Exposition without further reservation. The All Industry Exposition opens Monday, January 26, for inspection from 2:00 to 10:00 P.M. Tuesday, January 27, the exhibition is limited to service engineers, contractors and dealers only.

Convention Committees

Convention committees have been frequently meeting to perfect the final details of the convention. Cleveland Chapter with the experience of conducting the 9th Convention is cooperating with the Buckeye State Association to have this meeting surpass last years event.

Officers of the committees responsible for the various activities include:

General Convention Chairman: R. D. Hollingsworth.

Coordinating Chairman: John A. Brown.

Entertainment Chairman: Rod O'Flaherty.

Publicity Chairman: Paul Spring.

Housing Committee: Emil Flanik.

Reception Chairman: Elmer Weidwald.

Sergeant-at-Arms: Forrest D. Poole.

Mr. Hollingsworth is president of Cleveland Chapter and Oren Nichols, Jr., Medina, Ohio, is president of the Buckeye State Association.

LADIES' AUXILIARY

PLANS for the annual meeting of the Ladies Auxiliary are being completed to entertain members and visiting ladies to the Convention. All ladies whether members of the Auxiliary or not are cordially invited to participate in the events being arranged. Mrs. R. D. Hollingsworth, Cleveland, is chairlady of the local plans committee.

MRS. R. C. McCARTHY
President

MRS. J. SACKEY
Secretary

Officers of the Ladies' Auxiliary are:

Mrs. R. C. McCarthy, Rockford, Ill., President; Mrs. A. W. Overman, Rockford, Ill., 1st Vice-President; Mrs. John Sackey, Galesburg, Ill., Secretary; Mrs. Weldon Andrews, Syracuse, N. Y., Treasurer; Mrs. J. K. Driskell, Burley, Idaho, Sergeant-at-Arms.

Board of Directors are: Mrs. A. W. Dresback, Bloomington, Ill., Mrs. Dean Holmes, Minneapolis, Mrs. Jules DeWilde, Kansas City, Mo., Mrs. Einer Hansen, Flint, Michigan, and Mrs. A. W. Albertson, Huntington, West Virginia.

75,000 SQUARE FEET OF EXHIBITS WILL BE ON DISPLAY.

5th All Industry Refrigeration and Air Conditioning Exposition

Cleveland Auditorium— January 26, 27, 28 and 29

SEVENTY-FIVE THOUSAND square feet of exhibit space in four exposition halls in the large Cleveland Public Auditorium will present for the industry the largest exhibition of refrigeration and air conditioning equipment, parts, supplies and services by 172 exhibitors. Over 220 exhibit spaces will be used to house this large exhibition. The exhibition is sponsored by the Refrigeration Equipment Manufacturers Association.

Show Hours

The exhibition will run from Monday, January 26 through Thursday, January 29th. The show will not be open to the general public. Only members of the trade will be admitted. Show hours are as follows:

MONDAY, JANUARY 26—2 P. M. to 10 P. M.
Open to entire industry
TUESDAY, JANUARY 27—12 noon to 6 P. M.
Open only to service engineers, contractors and dealers
WEDNESDAY, JANUARY 28—12 NOON to 6 P. M.
Open to entire industry
THURSDAY, JANUARY 29—10 A. M. to 4 P. M.
Open to entire industry

The show will be open to wholesalers only from 10:00 A.M. to 2:00 P.M. Monday, January 26. Tuesday, January 27, has been set aside exclusively for service engineers, contractors and dealers.

THIS IS A PREVIEW OF A PORTION OF THE EXHIBITION TO BE SEEN.

Badge of Admittance

The registration badge issued by the various associations to their members and guests will admit visitors to the exhibition. Others will register at the exhibition hall.

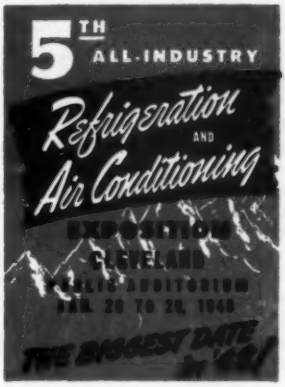
F. J. HOOD
Exhibit Chairman

The committee in charge of the exhibition is headed by F. J. Hood, Marinette, Wis., past president of REMA. John A. Marshall, Detroit, Mich., and J. A. Strachan, Cleveland, Ohio, are the other members.

All-Industry Banquet

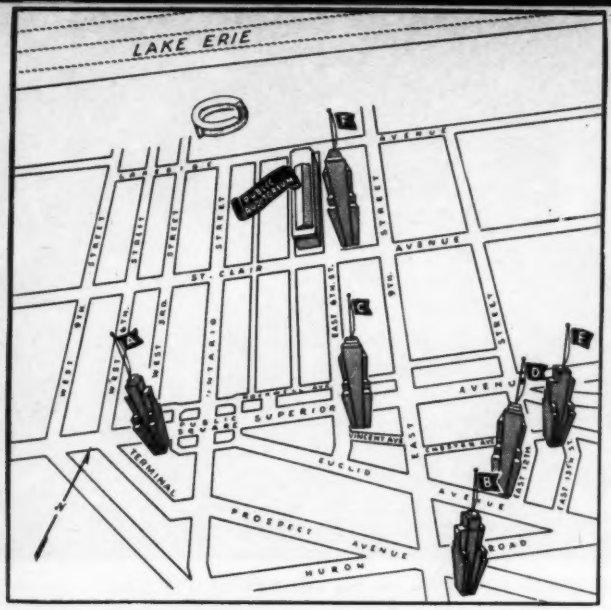
An all-industry banquet for 1,800 persons, January 28th, will highlight a busy week of parties, luncheons, dinners, conventions, and committee meetings which will be held in Cleveland in connection with the 5th All-Industry Refrigeration and Air Conditioning Exposition.

Scene of the banquet will be the vast arena floor of the Cleveland Public Auditorium where there will be continuous entertainment from 7:30 P.M. to 1 A.M., featuring two well known bands and numerous entertainment acts.



The banquet will feature a prime roast beef dinner, dancing, and continuous entertainment. An outstanding act on the program will be the Musical Majorettes, a flashy all-girl band which will provide music and entertainment. This nationally known organization is the official band of the Cleveland Browns football team.

The large NBC-WTAM orchestra will provide music for dancing. In addition there will be a beauty shop quartet, dance team, accordionist, and other first rate entertainment acts.



This diagram of downtown Cleveland shows the location of the various association hotel headquarters with relation to the Public Auditorium, scene of the 5th All-Industry Refrigeration and Air Conditioning Exposition, Jan. 26-29, 1948. The key to the hotels is as follows:

A, Cleveland, REMA and exhibitors; B, Carter, REMA, NCRSA, and exhibitors; C, Hollenden, RSES; D, Statler, REWA; E, Allerton, NARC; F, Auditorium, NCRSA.

Officers of REMA

PRESIDENT—E. M. Flannery, Bush Mfg. Co., Hartford, Conn.

VICE-PRESIDENT—H. F. Hildreth, Westinghouse Electric Corp., Springfield, Mass.

TREASURER—R. H. Israel, Virginia Smelting Co., West Norfolk, Va.

SECRETARY—K. B. Thorndike, Detroit Lubricator Co., Chicago, Ill.

IMMEDIATE PAST PRESIDENT—H. F. Spoehrer, Sporlan Valve Co., St. Louis, Mo.

EXECUTIVE SECRETARY—R. K. Hanson, Pittsburgh, Pa.

Directors—G. E. Graff, Ranco, Inc., Columbus, Ohio; Harry W. Jarrow, Jarrow Products, Chicago, Ill.; A. M. Kingsland, Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.; J. W. Krall, Tyler Fixture Co., Niles, Mich.; W. H. Maxwell, Wolverine Tube Div., Detroit, Mich.; H. C. Morrison, Curtis Refrigerating Machine Div., St. Louis, Mo.; John M. Schlemmer, General Controls Co., Glendale, California; W. A. Siegfried, Superior Valve and Fittings Co., Pittsburgh, Pa.

ADVISORY MEMBERS (Ex-Presidents)—J. S. Forbes, Superior Valve and Fittings Co., Pittsburgh, Pa.; E. A. Vallee, Automatic Products Co., Milwaukee, Wis.; F. J. Hood, Ansul Chemical Co., Marinette, Wis.

E. M. FLANNERY

H. F. HILDRETH

R. H. ISRAEL

K. B. THORNDIKE

REWA Plans For Cleveland

GEO. J. ROCHE
President

J. F. WICKAM
Vice President

A. H. HOLCOMBE, JR.
Treasurer

HEADQUARTERS for the Refrigeration Equipment Wholesalers Association for the 13th annual convention being held during the All Industry Exposition January 26 to 29 will be the Hotel Statler. The annual association meeting will consist of two sessions, morning and afternoon on Tuesday, January 27, 1948. Both sessions will be for REWA members only.

Officers

Officers of the Association are:

President, George J. Roche, Roche & Hull, Inc., Baltimore, Md.

Vice-President, J. F. Wickham, Wickham Supply Co., Lincoln, Nebr.

Secretary, I. J. Fajans, Aetna Supply Co., New York, N. Y.

Treasurer, A. H. Holcombe, Jr. Victor Sales & Supply Co., Philadelphia, Pa.

Immediate Past President, Theodore I. Glou, Central Service Supply Co., Syracuse, N. Y.

Executive Secretary, H. S. McCloud, Cincinnati, Ohio.

Directors: J. P. Glass, Chase Refrigeration Supply Co., Chicago, Ill.; H. W. Holt, Orr, Inc., Pittsburgh, Pa.; E. C. Marsden, Marsden & Wasserman, Inc., Hartford, Conn.; H. R. McCombs, McCombs Refrigeration Supply, Denver, Colo.; J. M. Mideke, Mideke Supply Co., Oklahoma City, Okla.; W. H. Parker, Hasco, Inc., Greensboro, N. C.; J. D. Ross, Railway & Engineering Specialties, Ltd., Montreal, Que.; N. W. Edwards.

Entertainment

The two entertainment features of the meeting will be a luncheon for REWA members and their ladies. Tuesday evening the annual banquet will be held and the new officers and directors will be introduced.

Meetings of the Manufacturers Relations and Trade Relations Committees are to be held on Saturday, January 24 at 2:00 P.M. at the Hotel Statler. The Board of Directors meeting is scheduled for Sunday, January 25.

Exhibitors and What They Will Display

(A black dot (•) preceding name indicates an advertiser whose current announcement can be found by referring to Index on page 116. The numeral following the name in parentheses refers to the Booth Number. Listings as of December 15, 1947.)

• ACE CABINET CORP. (905), 1010 E. 173rd St., New York 60, N. Y.—Cold plates, home and farm freezers, ice cream cabinet, soda fountain.

ACME INDUSTRIES, Inc. (604), 620 North Mechanic St., Jackson, Mich.—Water cooler, oil separator, evaporative condenser, cold storage unit cooler.

AIR CONDITIONING AND REFRIGERATION NEWS (507), 450 W. Fort St., Detroit 26, Mich.

• AIRSERCO MFG. CO. INC. (424), 435 Melwood St., Pittsburgh 13, Pa.—Airserco products, testing and analysis equipment for refrigeration engineers.

• ALCO VALVE CO. (608), 865 Kingsland Ave., St. Louis 5, Mo.—Thermostatic expansion valves, pressure regulating valves, solenoid valves, float valves, float switches.

ALUMINUM COMPANY OF AMERICA (918), Gulf Bldg., Pittsburgh 19, Pa.—Aluminum refrigerator parts, ducts, dehydrating chemicals.

THE AMERICAN BRASS CO. (217), Waterbury 88, Conn.—Tubing, fittings, charging hose.

AMERICAN FLANGE & MFG. CO., INC. (1112), 30 Rockefeller Plaza, New York 20, N. Y.—Ferro-Therm steel insulation.

AMERICAN INJECTOR CO. (126), 1481 14th St., Detroit 16, Mich.—Control valves and accessories.

AMERICAN REFRIGERATOR & MACHINE, INC. (711), 2700 University Ave., N.E., Minneapolis 13, Minn.—Freezers, frozen food display case, bottle cooler.

AMERICAN SOCIETY OF REFRIGERATING ENGINEERS (1204), 40 W. 40th St., N.Y.C.

• ANSUL CHEMICAL CO. (713) Marinette, Wis.—Refrigerants, special display.

ARCADE MFG. DIV. OF ROCKWELL MFG. CO. (1216), Freeport, Ill.—Refrigerator hardware.

ARMSTRONG CORK CO., Building Materials Div. (409), Lancaster, Pa.—Insulating material.

• AUTOMATIC PRODUCTS CO. (504), 2450 N. 32nd St., Milwaukee 10, Wis.—A-P thermostatic expansion valves, Trap-Dri dryer, strainer, Trap-It filter.

BAKER ICE MACHINE CO. INC. (506), 16th & Evans Sts., Omaha, Nebr.—Valves and fittings, high-capacity ammonia compressor.

BALLY CASE & COOLER CO. (1105 & 1107), Bally, Pa.—Refrigerated display cases.

BALTIMORE AIRCOIL CO. INC. (1212), 402 Colvin St., Baltimore 2, Md.—Type "U" and "CPE" condensers, liquid receivers.

BERRY MOTORS, INC. (1122), Corinth, Miss.—New rotary vaneless Freon compressor.

• BETZ CORP. (609), 445 State St., Hammond, Ind.—Complete line of forced convention cooling units.

R. H. BISHOP CO. (112), Champaign, Ill.—Food freezer, atticvane fan.

• BLACK, SIVALLS & BRYSON, INC. (320), 7500 E. 12th St., Kansas City, Mo.—Relief valves, safety heads.

BONNEY FORGE & TOOL WORKS (328), Allentown, Pa.—Service tools.

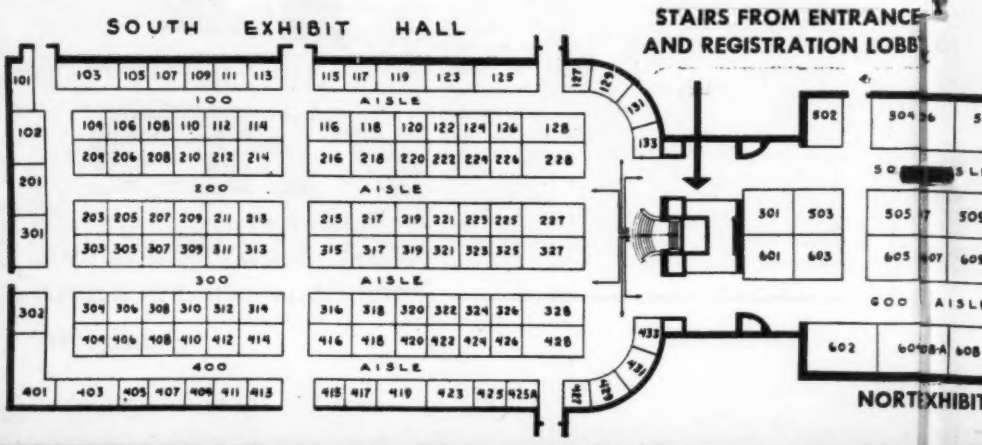
BREWER-TITCHENER CORP. (1020), Crandal-Stone Div., Binghamton, N. Y.

THE BROQUINDA CORP. (917 & 919), P.O. Box 35, 22nd St. Station, St. Petersburg 3, Fla.—A 22 ft. trailermobile semi-trailer complete with a Broquinda dry ice refrigerating system.

• BRUNNER MFG. CO. (304), 306 & 308), Broad St., Utica 1, N. Y.—Compressors and condensing units.

BUNDY TUBING CO. (407), 8109 E. Jefferson Ave., Detroit 14, Mich.—Tubing.

• BUSH MFG. CO. (610), 1031 New Britain Ave., Hartford 10, Conn.—Unit coolers, plate coils, condensers, low temperature units.



BUTCHER BOY COLD STORAGE DOOR CO. (101), 170 N. Sangamon St., Chicago 7, Ill.—Cold storage doors and hardware.

CENTURY ELECTRIC CO. (909), 1806 Pine St., St. Louis, Mo.—Demonstration of motors.

● CHICAGO SEAL CO. (323 & 325), 20 N. Wacker Dr., Chicago 6, Ill.—Innovations in compressor seal construction.

CHRYSLER CORP., AIRTEMP DIV. (103 & 105), Dayton 1, Ohio—Air conditioners, coolers, reach-in refrigerator.

CLEVELAND GRAPHITE BRONZE CO. (921), 17000 St. Clair Ave., Cleveland 10, Ohio—Sleeve bearings, colored slides of new plant.

CLEVELAND REFRIGERATOR CO. (915), 6600 Sidaway Ave., Cleveland 4, Ohio.

COLBAR, INC. (108 & 110), 215 N. Fourth St., Columbus 15, Ohio—Colbar dry beverage coolers.

COLEMAN EQUIPMENT CO. INC. (1219-A), 7529 S. Cottage Grove Ave., Chicago 19, Ill.

COOLSTREAM CORP. (1006), 240 Butler St., Brooklyn 17, N. Y.—Electric water coolers.

● COPELAND REFRIGERATION CORP. (703 & 705), Sidney, Ohio—Compressors and condensing units.

● CORDLEY & HAYES (401), 443 4th Ave., New York 16, N. Y.—Self-contained electric water coolers.

THE CORNELIUS CO. (914), 1621 E. Hennepin Ave., Minneapolis 14, Minn.

CROWN REFRIGERATOR CORP. (318), Metuchen, N. J.

CURTIS REFRIGERATING MACHINE DIV. OF CURTIS MFG. CO. (210, 212 & 214), 1905 Kienlen Ave., St. Louis 20, Mo.—Air conditioner, condensing units and special display units.

● CUTLER-HAMMER, INC. (128), 315 N. 12th St., Milwaukee 1, Wis.—Controls, alarm switch for home freezers.

● DAVISON CHEMICAL CORP. (311 & 313), 20 Hopkins Pl., Baltimore, Md.—Refrigeration grade silica gel.

DAY & NIGHT MFG. CO. (225), 710 Duarte Avenue, Monrovia, Cal.—Drinking fountain water cooler, evaporator plates, tank coolers.

DAYTON RUBBER MFG. CO. (415 & 417), Dayton 1, O.—Fractional horsepower V-belts.

● DETROIT LUBRICATOR CO. (503 & 603), 5900 Trumbull Ave., Detroit 8, Mich.—Detroit refrigeration and heating controls, engine safety controls, safety float valves, Detroit expansion valves and refrigeration accessories.

DOLE REFRIGERATING CO. (605), 5910 N. Pulaski Rd., Chicago 30, Ill.—Dole plates and low side equipment.

● E. I. DUPONT DE NEMOURS & CO., Electro-chemicals Dept. (414), Du Pont Bldg., Wilmington 98, Del.—"Artic" methyl chloride.

EATON MFG. CO. (1116), Carbondale, Ill.

● EBCO MFG. CO. (203, 205, 303 & 305), 401 West Town St., Columbus 8, Ohio—Electric water coolers.

● ELECTRIMATIC DIV. OF THE SIMONIZ CO. (215), 2100 Indiana Ave., Chicago 16, Ill.—Automatic controls, water regulators, and accessories.

ESTON CHEMICALS, INC. (224), 3100 E. 26th St., Los Angeles 23, Calif.—Refrigerants.

AUTOMATIC
Dependable

STOP Where Friends Gather...

at BOOTH NO. 504

5TH ALL-INDUSTRY EXPOSITION • CLEVELAND • JANUARY 26 TO 29

See the great display of new developments in A-P DEPENDABLE Refrigeration Valves . . . Developments that will help you to improved refrigeration, simpler installation and servicing — greater customer satisfaction and steadier profits — during the years ahead.

Be sure to pick up *your* copy of the new A-P Condensed Catalog waiting for you at BOOTH 504.

AUTOMATIC PRODUCTS COMPANY

2454 NORTH THIRTY-SECOND STREET • MILWAUKEE 10, WISCONSIN

Export Department, 13 East 40th Street, New York 16, N. Y

DEPENDABLE REFRIGERATION VALVES

STOCKED AND SOLD BY GOOD REFRIGERATION WHOLESALERS EVERYWHERE . . . RECOMMENDED AND INSTALLED BY LEADING REFRIGERATION SERVICE ENGINEERS

EVANS MFG. CORP. (1119), 460 S. Tenth Ave., Mt. Vernon, N. Y.

FEDDERS-QUIGAN CORP. (403), 57 Tonawanda St., Buffalo 7, N. Y.

FLEETWOOD AIRFLOW, INC. (911), 421 N. Pennsylvania Ave., Wilkes-Barre, Pa.—Commercial cases and coolers.

FOGEL REFRIGERATOR CO. (1021), 5400 Eadom St., Philadelphia 37, Pa.—Display cases and reach-in refrigerator.

FRANKLIN REFRIGERATION CO. (1120), 805 E. 145th St., New York 55, N. Y.

FRIGIDAIRE DIV. OF GENERAL MOTORS CORP. (1217), 300 Taylor St., Dayton 1, Ohio—Condensing units, evaporative condenser, cooling units.

● GENERAL CONTROLS CO. (314), 801 Allen Ave., Glendale 1, Calif.—Valves, pressure and temperature controls, strainers.

● GENERAL ELECTRIC CO. (115, 117, 416 & 418), 1 River Rd., Schenectady, N. Y.

GENERAL ENGINEERING & MFG. CO. (315, 317 & 319), 4417 Oleatha Ave., St. Louis 16, Mo.—Air conditioner and cut-away section of compressor.

L. H. GILMER CO. (1010), Tacony, Philadelphia 35, Pa.—Assortment of belts.

GRAND RAPIDS BRASS CO. (223), 66-90 Scribner Ave., N.W., Grand Rapids 4, Mich.—Commercial refrigerator hardware.

● HALSTEAD & MITCHELL (425-A), Bessemer Bldg., Pittsburgh 22, Pa.

● HEAT-X-CHANGER CO. (125), Brewster, N. Y.—Liquid soda fountain and beer coolers, heat exchangers.

HEATING, PIPING & AIR CONDITIONING (1119-A), Keeney Publishing Co., 6 N. Michigan Ave., Chicago 2, Ill.

● HENRY VALVE CO. (227), 3260 W. Grand Ave., Chicago 51, Ill.—Refrigerant valves and accessories.

● HIGHSIDE CHEMICALS CO. (321), 195 Verona Ave., Newark 4, N. J.—"Thawzone" fluid dehydrant, "Trace" refrigerant leak detector.

HUDSON PRODUCTS CO. INC. (502), 4400 St. Aubin St., Detroit 7, Mich.—Hudson constant pressure carbonator, Hudson 3-way drink dispenser.

IDEAL COOLER CORP. (902), 2953 Easton Ave., St. Louis 6, Mo.—Frozen food cabinet, beverage cooler, draft beer cooler.

● IMPERIAL BRASS MFG. CO. (426 & 428), 1200 W. Harrison St., Chicago 7, Ill.—DiaSeal valve, Torpedo dehydrator, service tools and accessories.

● JACK & HEINTZ PRECISION INDUSTRIES, INC (908), Cleveland 1, Ohio—Hermetic compressors.

● JAMISON COLD STORAGE DOOR CO. (1111), Hagerstown, Md.—Cold storage doors.

● JARROW PRODUCTS (322), 420 N. LaSalle St., Chicago 10, Ill.—Refrigerator door gaskets and insulation for cooling rooms and refrigerators.

JORDAN REFRIGERATOR CO. INC. (906), 235 N. Broad St., Philadelphia 7, Pa.

KASON HARDWARE CORP. (208), 127 Wallabout St., Brooklyn, N. Y.—Refrigerator hardware.

● KEROTEST MFG. CO. (220 & 222), 2525 Liberty Ave., Pittsburgh 16, Pa.—Refrigeration and air conditioning valves and fittings.

● KINETIC CHEMICALS, INC. (216), 10th & Market Sts., Wilmington 98, Del.—Laboratory tests of "Freon."

KLEEN-KUT MFG. CO. (209), 5501 Denison Ave., Cleveland 2, Ohio.

● KOLD-HOLD MFG. (411 & 413), 424 N. Grand Ave., Lansing 4, Mich.—Display of plate stand, bank and liner. Cold plates.

● KRAMER-TRENTON CO. (116 & 118), North Olden & Breuning Aves., Trenton 5, N. J.—Thermobank automatic defrosting system.

LACROSSE COOLER CO. (1110), 2809-17 Losey Blvd., S., LaCrosse, Wis.—Display of LaCrosse beverage cooling and dispensing equipment.

LARKIN COILS (710 & 712), 519 Memorial Drive, S.E., Atlanta, Ga.

● LEHIGH MFG. CO. INC. (226 & 228), 143 Fountain Ave., Lancaster, Pa.—Compressors, condensing units, cut away models.

LEWIN-MATHES CO. (1022), Lewin Metals Div., Chouteau Ave. at 12th St., St. Louis 2, Mo.—Seamless copper dehydrated and sealed refrigeration tubing. Display of copper in various stages of fabrication.

LIBERTY MOTORS & ENGRG. CORP (1207), P. O. Box 2937, Baltimore 29, Md.

LINDE AIR PRODUCTS CO. (1114), 30 E 42nd St., New York 17, N. Y.

● LYNCH MFG. CO. (102 & 201), Toledo 1, Ohio—Par condensing units.

● MARLO COIL CO. (404, 406, 408 & 410), 6135 Manchester, St. Louis 10, Mo.—Lowside equipment.

● JAS. P. MARSH CORP. (114), 2073 Southport Ave., Chicago 14, Ill.—Complete line of refrigeration gauges and dial thermometers.

MAYFLOWER PRODUCTS, INC. (122), 13 S. 5th St., Richmond, Ind.—Condensing Units, air conditioners.

McCORD CORPORATION (107), 2587 East Grand Blvd., Detroit 11, Mich.—Condensers and evaporators.

McCRAY REFRIGERATOR CO. (1213), Kendallville, Ind.—Reach-in refrigerator and frozen food display case.

● McINTIRE CONNECTOR CO. (611), 263 Jefferson St., Newark 5, N. J.—Driers, filters, strainers, wire mesh products.

McQUAY, INC. (602), 1600 Broadway, N.E., Minneapolis 13, Minn.

● MILLS INDUSTRIES, INC. (109 & 111), 4100 Fullerton Ave., Chicago 39, Ill.—Compressors and condensing units.

MINNEAPOLIS-HONEYWELL REGULATOR CO. (701), 2753 4th Ave. S., Minneapolis, Minn.—Polartron system of frost free refrigeration, temperature controls, pressure controls, thermostats.

MINNEAPOLIS SHOW CASE & FIXTURE CO. (1013), 1009 Washington Ave. S., Minneapolis 15, Minn.—Commercial cases and coolers.

MITCHELL MFG. CO. (1017), 2525 Clybourn Ave., Chicago 14, Ill.

● MUELLER BRASS CO. (307 & 309), 1925 Lapeer Ave., Port Huron, Mich.—Copper pipe and fittings, valves and accessories.

● NASH-KELVINATOR CORP. (901 & 1001), 14250 Plymouth Rd., Detroit 32, Mich.—Condensing units, ice cream cabinets, beverage coolers, home freezers, refrigeration parts.

THE NAT CORPORATION (1007), 2710 McGee Trafficway, Kansas City 8, Mo.

NATIONAL ASSN. OF REFRIGERATION CONTRACTORS (1218), 353 Hippodrome Annex, Cleveland, O.

NATIONAL COMMERCIAL REFRIGERATOR SALES ASSOCIATION (1202), 116 N. Seventh St., Minneapolis, Minn.

NEVINGER MFG. CO. (913), Greenville, Ill.

NICKERSON & COLLINS CO. (104 & 106), 433 N. Waller Ave., Chicago 44, Ill.—Books and trade publications.

ORLEY FREEZERS, INC. (1210), 475 Schaefer at Oakwood, Detroit 25, Mich.

OWENS-CORNING FIBERGLAS CORP. (1005), Toledo, Ohio—Fibreglas insulation.

PACIFIC LUMBER CO. (1208), 100 Bush St., San Francisco 4, Calif.—Palco wool insulation.

PACIFIC MFG. CORP. (1109), 5308 Blanche Ave. S.E., Cleveland 4, O.—Air conditioner.

PALEY MFG. CORP. (910), 244 Herkimer St., Brooklyn 16, N. Y.

● PEERLESS OF AMERICA, INC. (707 & 709), 333 N. Michigan Ave., Chicago, Ill.—Fin coils, flash coolers, air conditioning coils.

PENN BRASS & COPPER CO. INC. (613), Erie, Pa.—Refrigeration tubing, flaring tools.

● PENN ELECTRIC SWITCH CO. (1011) Goshen, Ind.—Water valves, solenoid valves, thermostats, temperature and pressure controls.

H. A. PHILLIPS & CO. (912), 3255 W. Carroll Ave., Chicago 24, Ill.—Float controls, injectors, control devices.

POLAR HARDWARE CO. (124), 1631 S. Michigan Ave., Chicago, Ill.—Refrigerator hardware and door gaskets.

PREST-O-MATIC PRODUCTS CO. INC. (405), 315 Beaubien St., Detroit 26, Mich.—Exhibiting a motorless carbonator.

QUILLEN BROTHERS REFRIGERATOR CO. (1009), 1639 Lafayette Rd., Indianapolis 8, Ind.—Farm and home freezers.

● RANCO, INC. (310 & 312), 601 W. Fifth Ave., Columbus 1, O.—Household and commercial refrigeration controls.

REDMOND CO. INC. (1211), Owosso, Mich.

● REFRIGERATION APPLIANCES, INC. (1015), 923 W. Lake St., Chicago 7, Ill.

REFRIGERATION CORP. OF AMERICA (508, 510 & 512), 55 W. 13th St., New York 11, N. Y.—Locker plant equipment, farm and home freezers.

REFRIGERATION ENGINEERING, INC. (914-A), 7250 E. Slauson Ave., Los Angeles 22, Calif.

REFRIGERATION ENGINEERING CO. (1205), 211 Foshay Tower, Minneapolis 2, Minn.

REFRIGERATION EQUIPMENT WHOLESALERS ASSN. (1206), 920 E. McMillan St., Cincinnati 6, Ohio.

REFRIGERATION PUBLICATIONS, INC. (607), 1240 Ontario St., Cleveland 13, O.

REFRIGERATION SERVICE ENGINEERS SOCIETY (1214), 433 N. Waller Ave., Chicago 44, Ill.

● REMCO, INC. (425), Zelienople, Pa.—Demonstration of "Cross-Flo" Driers-Filters.

ROTARY SEAL CO. (207), 2020 N. Larrabee St., Chicago 14, Ill.—Replacement seal units and assemblies.

SAFE-WAY FOOD LOCKER CO. (412), 175 W. Jackson Blvd., Chicago, Ill.—Food lockers.

● SANITARY REFRIGERATOR CO. (218), Fond Du Lac, Wis.—Home and farm freezers.

THE C. SCHMIDT CO. (113), John & Livingston Sts., Cincinnati 14, Ohio.

● SCHNACKE, INC. (123), 1016 E. Columbia, Evansville, Ind.—5 to 50 hp. condensing units and cut away models.

● SERVEL, INC. (429, 431 & 433), Evansville 20, Ind.

A. O. SMITH CORP. (1219), 310 S. Michigan Ave., Chicago, Ill.—Single phase motors from ½ to 3 hp., polyphase motors up to 5 hp.

SPENCER THERMOSTAT CO. (1008), Unit of Metals & Controls Corp., 34 Forest St., Attlesboro, Mass.

● SPORLAN VALVE CO. (219 & 221), 3723 Commonwealth Ave., St. Louis 17, Mo.—Expansion valves, pilot controls, refrigerant distributors and strainers.

● STANDARD REFRIGERATION CO. (324 & 326), 20 N. Wacker Dr., Chicago, Ill.—Heat transfer appliances.

STANGARD-DICKERSON CORP. (327), 46-76 Oliver St., Newark 5, N. J.—Ice cream cabinets, home and farm freezers, evaporator plates.

STODDARD MFG. CO. INC. (1019), 617 4th St., S.W., Mason City, Iowa.—Two new model freezers, refrigerated candy bar vendor.

SUN OIL CO. (920), 1608 Walnut St., Philadelphia 3, Pa.—Photographs of "floc" tests at Sun Oil laboratories, including actual test results.

● SUPERIOR VALVE & FITTINGS CO. (301), 1509 W. Liberty Ave., Pittsburgh 26, Pa.—Refrigeration and air conditioning valves and fittings, gauge manifolds, quick couplers, dehydrators, economizers, chargers.

THE HALSEY W. TAYLOR CO. (120), 137 North St., N.W., Warren, Ohio—Electric water coolers.

TECUMSEH PRODUCTS CO. (708), Tecumseh, Mich.—Condensing units and compressors.

● TEMPRITE PRODUCTS CORP. (509), 47 Piquette Ave., Detroit 2, Mich.—Cabinet type water cooler, water carbonator, combination water cooler and carbonator, instantaneous beverage and water coolers.

TENNEY ENGINEERING, INC. (423), 26 Avenue B, Newark, N. J.—Thermostatic expansion valve, ice maker, unit cooler.

THE TEXAS CO. (904), 135 E. 42nd St., New York 17, N. Y.—Demonstration of oil circulating in a refrigeration unit under operation.

EMERY THOMPSON MACHINE & SUPPLY CO. (1016), 1349 Inwood Ave., New York 52, N. Y.

THE TORRINGTON MFG. CO. (1108), 70 Franklin St., Torrington, Conn.—Airotor centrifugal blower wheels, propeller type fan blades.

TUBE MANIFOLD CORP. (1018), 1100 Military Road, Buffalo, N. Y.

TYLER FIXTURE CORP. (1002 & 1004), Niles 1, Mich.—Open frozen foods case, open meat and dairy case, reach-in refrigerator, home and farm locker, beverage cooler, conventional meat case.

TYPHOON AIR CONDITIONING CO. (907), 794 Union St., Brooklyn 15, N. Y.—Self-contained air conditioning units, introducing new models.

UNITED CORK CO.'S (316), 1151 Eddy St., Chicago, Ill.—Insulation.

UNITED FRIGUATOR ENGINEERS (427), Menominee, Mich.

UNITED REFRIGERATOR MFG. CO. (511 & 513), 350 Robert St., St. Paul 1, Minn.

● UNIVERSAL COOLER DIV. OF INTERNATIONAL DETROLA CORP. (127, 129, 131 & 133), Marion, O.—Compressors and condensing units.

VICTOR PRODUCTS CORP. (1012), Pope Ave., Hagerstown, Md.

VICTORY METAL MFG. CORP. (501 & 601), 1300 S. Front St., Philadelphia, Pa.—Dough retarders, display cases, bottle coolers, beer dispensing equipment.

● VIRGINIA SMELTING CO. (204 & 206), West Norfolk, Va.—Demonstration of new type leak detector. Pete Boyle, famed artist and caricaturist, in action.

● WABASH MFG. CO. (302), 2700 S. Michigan Ave., Chicago 16, Ill.—Replacement parts and service tools.

● WAGNER ELECTRIC CORP. (1118), 6400 Plymouth Ave., St. Louis 14, Mo.—Test of ¾ hp. single phase motor in 66 NEMA frame size. Replacement kits for motors.

● WAGNER TOOL & SUPPLY CORP. (1119-B), 13-08 43rd Ave., Long Island City 1, N.Y.

WARD REFRIGERATOR & MFG. (1121 & 1221), 6501 S. Alameda St., Los Angeles 1, Calif.—1948 models of Monterey commercial refrigerator line.

WEATHERHEAD CO. (119), 300 E. 131st St., Cleveland 8, O.—Refrigeration valves and fittings.

WEBER SHOWCASE & FIXTURE CO. INC. (1117), 5700 Avalon Blvd., Los Angeles 54, Calif.—Frosted food and ice cream cabinets.

WESTINGHOUSE ELECTRIC CORP. (419), 653 Page Blvd., Springfield 2, Mass.—Water coolers, milk coolers.

● WHITE-RODGERS ELECTRIC CO. (211 & 213), 1209 Cass Ave., St. Louis 6, Mo.—Temperature and pressure controls.

● WILSON REFRIGERATION, INC. (702, 704 & 706), Div. of Wilson Cabinet Co., Main St., Smyrna, Del.—Wilson sectional home and farm freezers, commercial refrigerators, walk-ins and milk coolers; featuring the new two-temperature refrigerators.

WOLVERINE TUBE DIVISION (505), 1411 Central Ave., Detroit 9, Mich.—Display of copper and brass tubing products.

THE YODER CO. (1014), 5500 Walworth Ave., Cleveland 2, Ohio.

YORK CORP. (420 & 422), Roosevelt Ave., York, Pa.

Air Conditioning *For a Humidor*

By HERBERT HANLEY

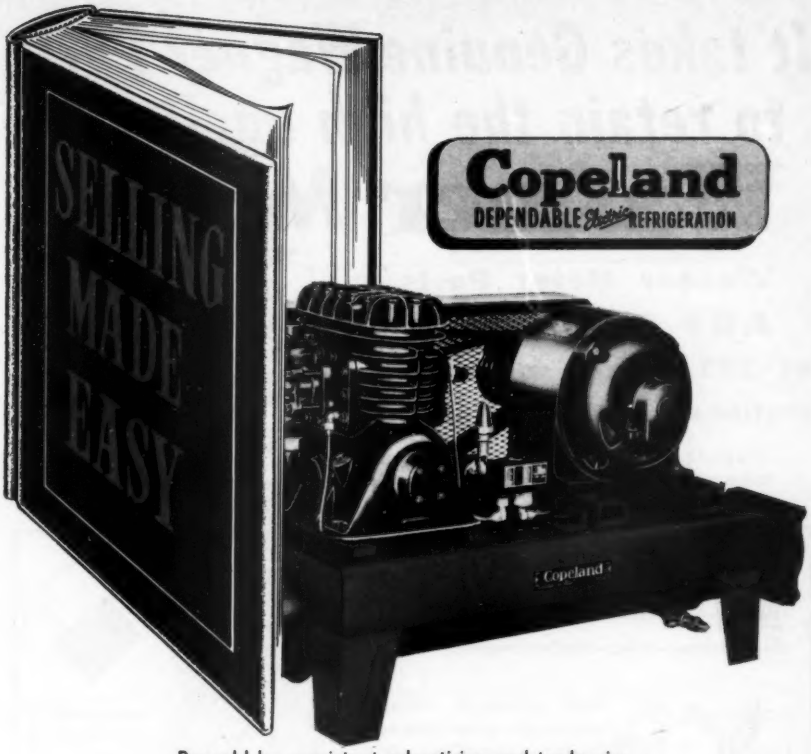
ONE of the most unusual small-scale air conditioning and humidifying installations in the midwest is an outstanding feature of the Humidor Room—novel tobacco display development in Glaser's, an exclusive men's gift store which opened recently in downtown St. Louis.

Most unusual feature of the Glaser store is the Humidor Room, a 10x7 foot room set into the right wall in the center of the store. Unlike the rest of the store, this room, which is walled off from the store floor by glass, is completely built of Spanish cedar, a soft-tan porous wood, which, through the centuries, has proven itself best for keeping tobacco in tip-top condition.

Because of the strong pull which fine tobacco will undeniably exercise over men, the Glaser management has spent a lot of time and money in design of the room. In addition to the humidity-retaining powers of the Spanish cedar, the room contains a novel small-scale air conditioning system and humidifying system built by Mid-town Engineering Company, St. Louis refrigeration specialists.

A tiny Filterpure air conditioning unit powered by a ½ hp. compressor is located on a shelf over the doorway into the glassed-in section out of sight. This keeps the air constantly circulating to maintain a temperature of around 70 degrees winter and summer. The water which is used to cool the condensing unit is passed by means of copper tubing to a 3x2 foot water tray at the end of the same shelf, in which a 2 foot rotary brush is kept constantly turning by a quarter horsepower electric motor. The same motor also operates a small blower, which forces a stream of air over the water-saturated bristles of the brush. This, in combination with the air conditioning maintains relative humidity at 80% or better in the Humidor Room, according to Sam Glaser, head of the store.

All tobacco carried in the store will be kept in this Humidor Room. One of the most unusual features is the fact that 30 shelves at the back of the Humidor Room are devoted to "individual ownership" boxes of cigars. Men who wish to become regular patrons of the store, and specify a particular type of cigar, are honored by a wooden strip sign which is tacked on the front of their box of cigars, and identifies the box as their property. These customers are free to walk into the humidified room to select their own cigars whenever desired. The store guarantees to place a new box of the same brand on the shelf whenever the first box is empty. Within two weeks, 55 St. Louis business executives had contracted for this novel idea.



Pre-sold by consistent advertising and trade-wise reputation, Copeland units are in constant demand. They also open the door to sales of associated equipment and installations.

When you offer Copeland to prospects, you're halfway home to an order. Have the unit for every purpose with Copeland's complete line. Sell the economy, smooth operation and long life of Copeland. Immediate delivery on 1 to 7½ h.p. units.

SEE OUR FULL LINE AT THE SHOW

COPELAND REFRIGERATION CORPORATION, SIDNEY, OHIO

It takes Genuine Wagner Parts to retain the high quality of

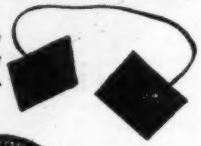
Wagner Motors

Wagner Motor Parts
ARE AVAILABLE
at 325 authorized service stations displaying this sign

Wagner designs and builds each motor part to assure dependable service for which Wagner motors are world-famous. When it's a Wagner motor, be sure to put in genuine Wagner motor parts.

Dependable switches with silver contacts.

Correct-grade brushes assure new motor performance.



Rigid, lightweight, one-piece brush-holder assemblies have carefully selected springs to assure proper contact between brushes and commutator.

Commutator originally designed as an inherent part of the motor.

Full-finished bimetal bearings ready to install. May be had unbored for undersized shafts.

Nonhardening wicks of pure wool which actually filter the oil.

M46-8A

Ask for Catalog MU-40. Every repair shop needs one. It helps you determine the catalog number and price of Wagner motor parts.

Wagner WE Electric

6433 Plymouth Avenue • St. Louis 14, Mo., U. S. A.

Contractors Hold Annual Meet

Allerton Hotel, Cleveland, January 26 and 27

W. W. FARR
President

E. S. WRIGHT
1st Vice Pres.

J. F. PARKS
2nd Vice Pres.

L. C. ANDERSON
Sgt.-at-Arms

THE National Association of Refrigeration Contractors meet in annual convention, Monday and Tuesday mornings, January 26 and 27 at the Allerton Hotel, Cleveland.

Registration starts Sunday, January 25 at 9:00 A.M. and continues throughout the day.

The Board of Directors of the Association will meet on Sunday and Tuesday, January 25 and 27.

N. EDELSTEIN
Recording Sec.

A. M. PALEN
Treasurer

A press luncheon meeting for the members, wives, guests and friends will be held Monday, January 26th in the Allerton Ballroom. A very intriguing program is well under way.

Program of Activities

On Monday, January 26, 9:30 A.M. the annual meeting will convene to receive the President's report and hear other speakers on matters of pertinent interest to contractors.

At 12:30 P.M. a press luncheon will be held.

Elect New Directors

On Tuesday, January 27 at 9:30 A.M. the convention will hear speakers, receive committee reports and elect directors.

Formed in January 1946, the National Association of Refrigeration Contractors has grown to representation in 43 states and Canada, and embraces 23 affiliates, a number of which are state associations. Members are located in virtually every principal city in the United States.

Objects of Association

The twenty-one objectives of the association are aimed at promoting the welfare of its members by distributing information, statistics and engineering data; promoting more friendly relations within the industry and between employers and employees; to foster better business practices and to cooperate with municipal, state and federal governments in matters of public interest and to protect the consuming public by providing the best refrigeration installations possible to safeguard life, health and property.

All program activities are designed to carrying out the twenty-one objectives.

NEWS AND ACTIVITIES

An Excursion Into The Desert of Events

California Institute of Technology Host to Los Angeles Chapter of R.S.E.S.

THE October meeting of Los Angeles Chapter, R.S.E.S. was held in the Norman Bridge Laboratories of Physics at the California Institute of Technology. Over two hundred members of the various Southern California chapters attended.

The speaker, Dr. Alexander Goetz, Associate Professor of Physics, entitled his talk "An Excursion into the Desert of Events." This was a forty five minute talk followed by an hour devoted to the inspection of their liquid air plant.

The liquid air plant proved to be of exceptional interest to the group attending. Located in one of the sub floors, it is used to manufacture liquid air for refrigeration purposes in low temperature experiments. For economy of space the customary "Linde" process is modified. The plant was designed by Dr. Goetz and built under his supervision. It is capable of producing 30 pounds of liquid air per hour.

Two of Dr. Goetz' opening remarks were, "Temperature is the only concept of physics that is without dimension; it has neither volume, mass, area nor weight" and "Temperature is an indication of the type and probability of events within the system under consideration." These remarks were found to have particular significance during the entire talk. (All references to temperature are based on the centigrade scale).

A chart was projected on a screen (Fig. 1) indicating temperatures from absolute zero to 100,000 centigrade absolute. In order to make this chart readable, it was arranged on a logarithmic scale and showed four temperature ranges. Those determined by the use of pyrometers, thermometers, gas thermometers and magnetometry.

Starting at the left with the range determined by pyrometers, the chart shows that realm of temperatures found only in astro-

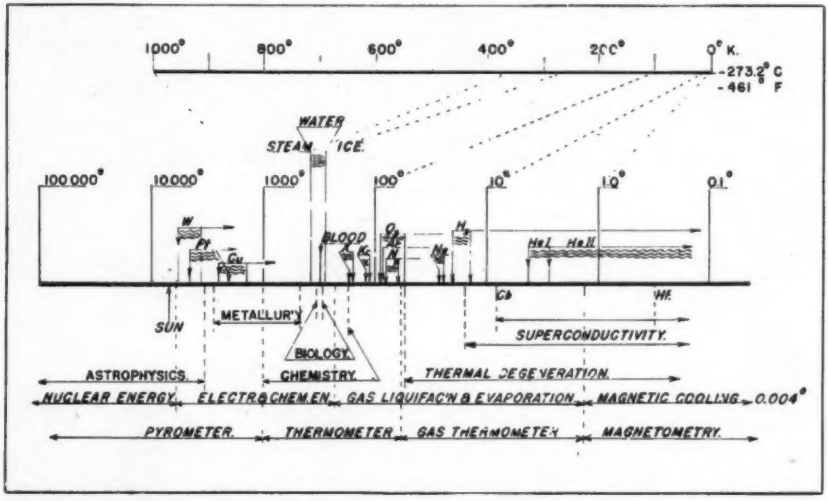


Fig. 1—The chart which Dr. Goetz used in his discussion.

Closer reading in the Normal Range

SEE the New MARSH Instruments at BOOTH 114

All-Industry Exposition, Cleveland Jan. 26 through 29

—when you use the new MARSH Compound Retard Gauge

One more shining example of a Marsh refrigeration instrument particularly well fitted to its job is this new Compound Retard Gauge. It provides a full range of both vacuum and pressure indication for systems using sulphur dioxide, methyl chloride, Freon and other refrigerants that will not deteriorate brass, but its retarded movement permits easy, close reading in the important range from zero to 50 lbs.

Produced in a handsome, business-like black steel case with pyralin crystal, this compound retard gauge is one more welcome addition to the Marsh line of quality refrigeration instruments — standard pressure and compound gauges, ammonia gauges, corresponding pressure-temperature gauges, remote reading thermometers and the popular new Marsh "Serviceman" line in single and 4-scale types as briefly described opposite.

All Marsh refrigeration instruments are available with the "Recalibrator"—quickest and best way to correct a gauge or thermometer that has been knocked out of adjustment. Ask for new catalog sheets covering the Marsh line.

JAS. P. MARSH CORPORATION
DEPT. Q, SKOKIE, ILLINOIS

New 4-scale "Serviceman"

An all-purpose remote-reading serviceman's thermometer. Embodies all the features of the single scale "Serviceman" (below). In addition, shows equivalent pressures for Freon, sulphur dioxide, and methyl chloride.

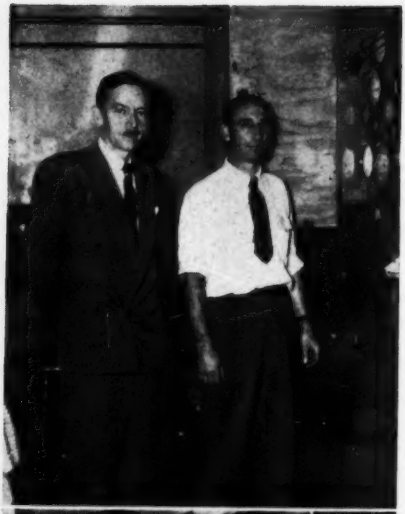
Standard Serviceman

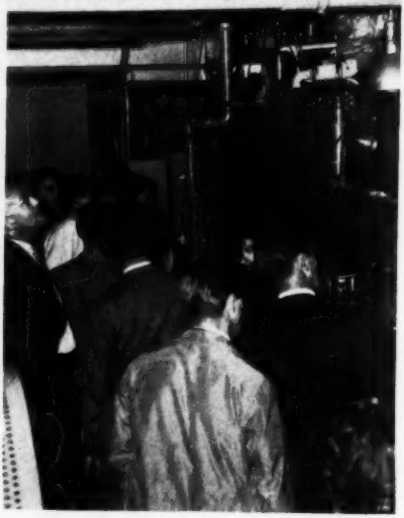
Checks them to 30 below. Has five feet of tubing, neatly concealed in case when not in use, slender enough to pass between gasket and jamb of closed refrigerator door. Large scale production has made it possible to *reduce its price*, making it a still more remarkable value.

MARSH

Refrigeration Instruments

BUY FROM YOUR WHOLESALER





Left to right (above) are: Dr. Alexander Goetz, speaker of the evening; Leslie R. Burt, Laboratory Technician in charge of the liquid air plant.

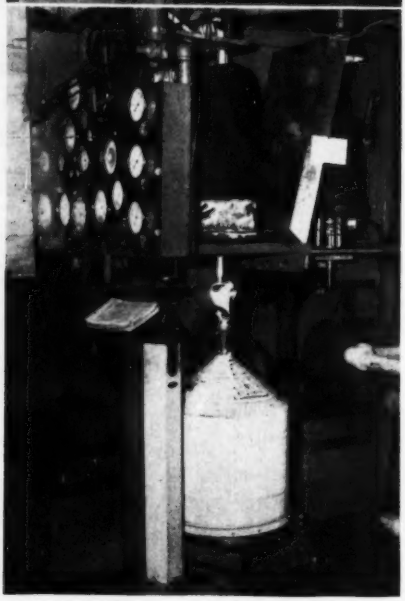
Below: This portion of the crowd that inspected the liquid air plant portray extreme interest in the equipment.

physics. In this range no reactions of a chemical nature, as we know them, can occur because only the chemical elements exist and then only as vapors. This range is from approximately 6000° Absolute on up to infinity. There are extremes of temperature above those shown that are impossible of attaining.

In this highest range of temperatures we find nuclear energy. The first condensates to appear in cooling are the liquid phase of tungsten, from approximately 6200° to 3643°, and the liquid phase of platinum, from approximately 4600° to 2028°. The liquid phase temperature range of several elements are shown as waving lines, together with their symbols. As there are only relatively few substances that can exist as solids or liquids above 1000° Absolute, and nothing but vapors above 6000° Absolute, determination of these temperatures is accomplished by the use of radiation measurements (pyrometer, spectrography, etc.).

In the usual liquid thermometer range are temperatures of from 1000° Absolute down to approximately 80° Absolute. Here we find the elements and conditions that are most familiar to us. This includes the lower temperatures of metallurgy as well as all of chemistry and biology. The electric forces among atoms become sufficiently dominant in this range to form groups (molecules) of sometimes amazing complexity (chemical compounds) and similar forces effect, at the lower end of this range, the liquifaction of gases like nitrogen, oxygen, etc. It is interesting to note the comparatively narrow spread of temperatures in which water exists at a pressure of one atmosphere. Below 273° Absolute we have ice and above 373° Absolute, steam or water vapor. More interesting to the refrigeration engineer than any of the other temperature ranges indicated on the chart is that of biology. It is in this very narrow range that bacteria are most active and fortunate indeed that it is not necessary to reduce temperatures to say 100° Absolute (-173° C) in order to effectively control their activity. In the lower portion of this medium range we find the liquid temperatures of Xenon, Kripton, Oxygen, Argon and Nitrogen.

Below this point there are so few liquids (Neon, Hydrogen, Helium) that it is necessary to determine temperatures by the use of gas thermometers. This, no doubt, is the most accurate instrument used in determining temperatures. In this range thermal degeneration and superconductivity are ex-



Dr. Goetz (above) transfers liquid air from a large to a small thermos jug during his demonstration of the effect of low temperatures on various materials.

The liquid air plant (below) showing large thermos jug being filled.

perienced. Here the rapidity of molecular motion is considerably slowed. Experiments have shown that pure metals such as copper remain pliable in these temperatures whereas alloyed metals such as the various steels become extremely brittle. There are certain plastics that also remain semi-pliable in these extreme temperatures, however most plastics become very brittle. Dr. Goetz was able to illustrate this by freezing different plastics in liquid air.

In the very lowest range magnetometry must be used in determining temperatures. This area is characterized by an almost total lack of molecular activity. It is the "Desert of Events." Dr. Goetz remarked that it is not expected that we shall ever be able to reduce this activity to nil, and consequently can not expect to reach absolute zero.

Effects of Low Temperature

A thermos jug of liquid air was handy. This liquid air was used to demonstrate what Dr. Goetz referred to as "Theatricals." Rubber hose, flowers and yeast were submerged in the liquid air momentarily and removed, frozen brittle. The brittle condition of these was shown by striking them with a small hammer. In the case of the flowers, they were shattered by Dr. Goetz flicking them with his finger.

Although these were theatricals, they had their practical value. In order to demonstrate the effect of water crystalline formations during the freezing of living cells a cake of yeast was used. Normal freezing speeds and even freezing by liquid air allowed a cellular breakdown to occur. Illustrating this a cake of yeast was cut in half. Half of this yeast cake was frozen in the liquid air and placed on a platform beside the unfrozen half. The shape of these two yeast cake halves was projected on a screen so that they were visible to the entire audience. As the half that was frozen thawed, the effect of the breakdown of its cells became very apparent; it melted down to a semi-fluid mass. The unfrozen half retained its original form.

Concurrent with this discussion two slides were projected on the screen. The first slide showed the effects of a very rapid reduction of the temperature of water. It was noted that the water remained as a liquid even when considerably below its freezing temperature. The forces of nature, of course, soon catch up with this phenomenon and the temperature of the water lowers to its freez-

Handy—Clean—Economical!

PIPETITE-Stik

. . . the New PIPE JOINT COMPOUND *in Stick Form*

PIPETITE-STIK is a sensational new development in a pipe joint compound. It banishes old methods of compound application through its convenient stick form which also prevents excessive compound waste and saves time. Provides positive seal for practically every type of pipe conveyance such as Freon, methyl chloride, butane, propane and other refrigerants, oil, air, water, brine, etc. It prevents rusting and allows disconnection of joints at any time. Lubricates and completely seals pipe joint threads, nuts, bolts, gaskets, turnbuckles, etc.

TWO SIZES: Regular and Heavy Duty Jumbo for Larger Diameter Pipes.

FLUX-Stik

. . . the New SOLDERING FLUX *in Stick Form*

FLUX-STIK is an advanced scientific achievement for faster, simpler and easier soldering. It does away with the old, awkward methods through its convenient stick form which can be handled as easily as a pencil.
FLUX-STIK is non-running, non-acid and non-injurious. Can be applied to both cold and hot metals and is a more efficient surface cleaner and fluxing agent than other types of flux. Ideal for use in refrigeration, air conditioning, plumbing, heaters, pipes, fabricating and other similar applications. **FLUX-STIK** is today's modern method of surface preparation.

Double Action— A Surface Cleaner and Fluxing Agent in One!

Ask Your Dealer or Write Us.

Lake Chemical Co. **626 N. WESTERN AVE., CHICAGO 12, ILL.**

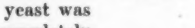
The expressions on these faces reflect the deep and absorbing interest of the crowd. Over 200 men witnessed the demonstration and lecture.

ing point and then the water becomes a solid.

The second slide was a graph plotting time and temperature and showing an area which was the area of crystalline formation of yeast. If the temperature of the yeast was reduced rapidly enough it would completely escape passing through this crystalline area and become a solid without forming crystals. The time of freezing in order to escape this crystalline area was in the nature of 1/50 second or less. At the present time this speed of freezing is beyond mechanical practicabilities but certainly the objective of almost perfect preservation of food stuffs by this ultra fast changing of state is just as practical as the benefits to be derived from it.

It is well for the men of industry to reflect on the value of such research. As recently as 150 years ago science regarded heat as "a subtle imponderable fluid called "caloric" with the power of penetrating, expanding and dissolving bodies, or dissipating them in vapor."[1] Work done during the 17th and 18th centuries by Newton, Regnault, James Watt, Joule, Rumford and others clarified this conception and their findings are the common tools of our industry today. The discovery of other neutral laws by today's men of research will be made practical by tomorrow's Engineers and maintained by its mechanics. Such are the benefits of research.

(1) Encyclopedia Britannica, Vol. 11, Page 317



MONTANA STATE GROUP MEETS

THE first State Convention of the Montant group was held in Lewistown, with the members of Midland Empire and North Montana Chapters attending. Norman Sulnes of Billings was elected Chairman of the meeting and S. C. Wacker of Great Falls was elected Secretary.

At 4:30 p.m., James Reynolds of Minneapolis-Honeywell Regulator Co. displayed refrigeration and air conditioning controls and recording thermometers. Mr. Reynolds explained the uses and applications of the controls.

All present met again at 6:30 for dinner. Roy Marsh, President of the Lewistown Rotary Club, gave an address of welcome to the Society members and guests. The educational program for the evening was provided by O. C. Yates, and included motion pictures of the manufacturing processes of Peerless coil, after which Mr. Yates gave a talk on reverse cycle refrigeration.

R.S.E.S. Investigates Recommended Filling Densities of Cylinders

A RECENT accident in Los Angeles caused by an exploding ammonia cylinder prompted an investigation of the ICC recommended filling density of cylinders. Paul B. Reed, Chairman of the International Examining Board of the Refrigeration Service Engineers Society, summarized the results of the investigation which he lead, in a letter addressed to H. A. Campbell, Bureau of Explosives, Assn. of American Railroads, New York, N. Y. The letter follows:

"The death recently of a refrigeration repair man in Los Angeles has been called to the attention of this Society. This man was killed by the explosion of a cylinder of anhydrous ammonia, which from available evidence was filled according to ICC regulations, although it was three years beyond the five year test period. The cylinder was in the man's closed sedan, but exposed to the direct rays of the sun. In many similar accidents of this nature, the blame has been laid to over-filling of the cylinder, but this appears not to have been true in this instance.

"In investigating the regulations of ICC, it becomes evident that there are certain combinations of conditions which can easily cause an explosion but which may not be contrary to ICC regulations.

"Sections 302 and 303 of Tariff No. 4 with Supplements 6, 7, 9, 14 and 15 prescribe the permissible weight of refrigerant that may be put into a cylinder, as the total water capacity of that cylinder in pounds at 60F multiplied by a percentage factor based on the specific gravity of the liquid of the given refrigerant at some chosen temperature.

"Taking anhydrous ammonia as an example, the factor (referred to in the Tariff as "Filling Density") is 54%. Thus a cylinder that has one cubic foot internal volume, will, at 60F hold 62.383 pounds of water and it is permissible to put as much as .54 x 62.383 or 33.69 pounds of anhydrous ammonia in it.

"If this same cylinder with 33.69 pounds of ammonia in it is exposed to heat, the liquid ammonia in it expands in volume as it becomes warmer. As it rises in temperature the vapor pressure rises also, in accordance with the saturation pressure-temperature relationship curve for ammonia. At 60F the vapor pressure is 92.9 p.s.i.g. (pounds per square inch gauge), at 100F, 197.2 p.s.i.g., etc. As long as there is some gas space left above the liquid the pressure will be saturation pressure—no more, no less.

"At 145F the saturation pressure is 390.8 p.s.i.g., and the liquid almost entirely fills the cylinder, for at 145F the density of liquid ammonia is 33.72 pounds per cubic foot. At 146F the density is 33.69, so there is no gas space left.

"Any further rise in temperature results in hydrostatic pressures that rise very rapidly to extremely high pressures which distort the cylinder and eventually cause it to burst with explosive violence.

"Protection can be afforded by a pressure relief device or a fusible plug that melts at 146F or below, and releases the ammonia to the atmosphere. This is objectionable not only because of the loss of the refrigerant, but what is more important, because diffusion of large amounts of ammonia in inhabited places is hazardous to human and animal life.

"It appears to us that the pressure relief device or fusible plug should operate to discharge the refrigerant only in case of fire or similar emergencies. The melting temperature of about 165F for fusible plugs used at present appears to be low enough to protect against such emergencies and yet high enough to prevent unnecessary discharge of refrigerant cylinders.

"But there should be protection in the range between 146F and 165F. This can be afforded by reducing the permissible filling density. Fusible plugs are, we understand, permitted up to 170F, so if the amount of refrigerant put into the cylinder were limited to only as much as would entirely fill the cylinder at 170F, adequate protection would be afforded.

"That is, the filling density factor should be such that the product of it and the water content of the cylinder would equal the density of the refrigerant at 170F. For am-

NEW

HAND-SIZE APPLIANCE TESTER . . .

for volts, amperes, watts

Simpson Model 390
Volt-Amp-Wattmeter

Model 390 is the first appliance tester ever made that gives you volt, ampere and wattage readings all from one small, compact instrument. It slips easily into a large pocket, weighs only a pound and a half, is designed for hard, continuous service.

You merely plug Model 390 and appliance to be tested into the Break-in plug furnished—voltage will read. To read watts or amperes, simply press one of the two buttons at bottom of the panel.

USE MODEL 390 FOR TESTING

Refrigerators	Electric Heaters
Deep Freezers	Radio Sets
Washing Machines	Lamps
Irons	Vacuum Cleaners
Toasters	and all similar
Motors	appliances

RANGES: Volts: 0-150, 0-300
Amperes: 0-3, 0-15
Watts: 0-300, 0-600, 0-1500, 0-3000
Size: 3" x 5⅞" x 2½". Weight 1½ lbs.
Shipping weight 3 lbs.

Price, with Break-in plug and leads	$39.50
Leatherette Carrying Case	4.00
Genuine Leather Carrying Case	8.00

ASK YOUR JOBBER

SIMPSON ELECTRIC COMPANY
5200-5218 W. Kinzie St., Chicago 44, Ill.
In Canada, Bach-Simpson Ltd., London, Ontario

Simpson
INSTRUMENTS THAT STAY ACCURATE

monia this would be 51% which would limit the permissible ammonia content of cylinders to 32 pounds per cubic foot of cylinder volume.

"In examining the filling density factors for other refrigerants it develops that many of the common refrigerants are worse than for ammonia. Present filling densities permit hydrostatic pressures to start at 133F for Freon 12 and Freon 22, at 138F for methyl chloride and at 146F for sulphur dioxide.

"We recommend that this entire subject be reviewed as soon as possible and that maximum filling densities based on 170F be established. This will result in the following factors:

Ammonia	51%	Freon 11	134%
Sulphur Dioxide ...	120%	Freon 12	110%
Methyl Chloride ...	79%	Freon 21	123%
Isobutane	48%	Freon 22	92%
Propane	40%	Freon 113	143%
		Freon 114	125%

"It appears that at least some of the refrigerant manufacturers are aware of this hazard for many of them fill their cylinders much less than permitted by ICC regulations.

"In this matter we are motivated primarily by our interest in the safety of our members who use refrigerants in cylinders in their daily work and who are constantly exposed to any hazards attending their filling, handling and use. Even under the most favorable conditions accidents with refrigerants are not uncommon, but it is obvious that the condition above described constitutes a definite danger and one that has caused serious and fatal accidents." *Signed —Paul B. Reed, Chairman.*

NEW CHICAGO AREA CHAPTER IN FORMATION

REALIZING the value of close association in their work, 28 refrigeration men met on Tuesday evening, December 9, at the Service Parts Company, Melrose Park, to form a local chapter of the R.S.E.S.

Refrigeration men in this area were contacted by Ed Riccio, chairman of the new chapter's committee for the Illinois Association. The meeting date and place was arranged through the cooperation of Pat Ravanesi, President of the Service Parts Company, who offered the facilities and served refreshments after the meeting.

Mr. Riccio presided at the opening of the meeting and introduced Willis Stafford of the Herman Goldberg Company and former Regional Director for the R.S.E.S. Mr. Stafford thoroughly covered the activities and benefits derived from affiliating with the International Society. With the help of R. L. Hendrickson, Nickerson & Collins Co.; Dwight D. Orr, Chicago Seal Co.; Harry D. Busby, Nickerson & Collins Co., and several other Chicago Chapter members, the questions which were asked by prospective members were fully answered.

Temporary officers were then appointed. They were: Chester Lee, Chairman, 515 South 9th Ave., Maywood, and A. J. Raszkawski, Secretary-Treasurer, 39 W. Van Buren, Bellwood. Those signing the petition for charter adopted the name of Chicago West Towns Chapter. Meeting dates were tentatively set for the third Tuesday of each month.

COMING CONVENTIONS

RSES Annual Convention
Place: Hollenden Hotel
City: Cleveland, Ohio
Date: Jan. 21, 22, 23, 24, 1948
Secretary: H. T. McDermott, 433 N. Waller Ave., Chicago 44, Ill.

R.E.M.A.—All-Industry Exposition
Place: Cleveland Public Auditorium
City: Cleveland, Ohio
Date: January 26-29, incl., 1948
Secretary: R. Kennedy Hanson, 1107 Clark Bldg., Pittsburgh, Pennsylvania

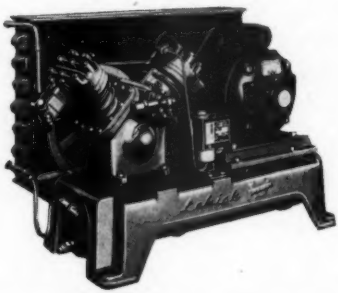
Virginia State Charter Meeting
City: Richmond, Va.
Date: February 14, 1948
Chairman: B. A. Hauck, 3110 Kensington Ave., Apt. 9, Richmond, Va.

Iowa State Association
City: Waterloo, Iowa
Date: March 6 and 7
President: Ervin Meyer, 2960 Jefferson Ave., Davenport, Iowa

Interprovincial Association
Place: King Edward Hotel
City: Toronto, Ont.
Date: March 9, 10, 1948
Secretary: E. G. McCracken, 215 Laird Drive, Leaside, Ontario.

California State Association
Place: Palace Hotel
City: San Francisco, Calif.
Date: April 30, May 1 and 2
Chairman: David Fagg, 1951 E. 14th St., Oakland, California

Lehigh BLU-COLD
COMMERCIAL REFRIGERATION



"WE'LL BE SEEING YOU IN CLEVELAND"

SAYS THE LEHIGH TEAM

If the big shindig in Cleveland is only half as good as its advance notices, it will be the "greatest show on earth" for all of us in the refrigeration business.

Lehigh BLU-COLD will be there with the "works" —and you are cordially invited to make

BOOTHS 226—228

your headquarters.

The first issue of our new service manual and parts catalog will be at the booth for you—and there will be a lot of exhibits of special interest to you. We will be looking for you

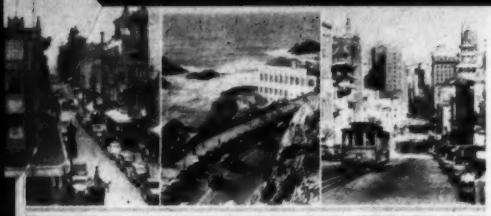
Lehigh **BLU-COLD**

HEAVY DUTY CONDENSING UNITS

Manufactured By

Lehigh Manufacturing Co.

Plant—LANCASTER, PENNA.



SECOND ANNUAL
WESTERN REFRIGERATION EDUCATIONAL
EXHIBIT AND CONFERENCE

In Connection with the

SECOND ANNUAL CONVENTION

of the

California Association of the Refrigeration Service Engineers Society

Palace Hotel, San Francisco, California

APRIL 30th, MAY 1st and 2nd, 1948

PACIFIC COAST CONVENTION PLANS MOVING RAPIDLY

RUNNING in high gear, committees planning the second annual convention of the California Association of the Refrigeration Service Engineers Society in San Francisco, April 30 and May 1 and 2, are releasing the first publicity covering this event which is expected to attract a large attendance of service engineers, contractors and dealers from the eleven western states.

CALIFORNIA CONVENTION COMMITTEE CHAIRMEN (Upper Photo)

Front row: David Fagg, General Chairman; M. B. Mills, Contracts. Back row: C. R. Rustin, Publicity; Rowland Cooke, Arrangements; W. E. Wharton, Convention Coordinator.

LOCAL CONVENTION COMMITTEE PERSONNEL

Front row: H. J. Dyke, Jr., Educational; Frank Dwyer, Housing. Back row: Wm. Dougherty, Housing; Harry Howard, Year Book and Registration; Ed Zlibin, Exhibits; Eugene Larson.

The Western Refrigeration Educational Exhibit being held in conjunction with the educational conference, will be limited to those types of displays designed to further "promotion through education."

The Concert and Gold Rooms of the Palace Hotel have been reserved to house the educational exhibits.

Chapter Notes

● ARROWHEAD CHAPTER, *Riverside, California, Oct. 27*—Plans for an anniversary party, to be held about the middle of January, were discussed at length and Mr. DeWeese, Chairman of the Entertainment Committee, appointed Mr. Edwards to act as Hall Committee and Mr. McCulley as Music Committee. B. H. Riley is to have charge of ticket sales and distribution.

At the November 10th meeting, business was dispensed with to allow more time for the educational program. Educational Director Carlton Ricker introduced the speaker of the evening who was C. L. Olin of Servel, Inc. Mr. Olin spoke on the Servel line of commercial and domestic hermetic units, which was of interest to all present. After the educational program, the drawing for door prizes was held. Mr. DeWeese won a seal-ring puller but returned it to the chapter to be auctioned off to the highest bidder, who proved to be Mr. Hibbard. The grand prize—a punch and chisel set—was won by B. H. Riley. During the course of the evening, Al Klein and Ray J. McCafferty were accepted as members.

● ATLANTA CHAPTER, *Atlanta, Ga., Nov. 26*—During the business meeting, T. L. Carnell was elected delegate to the International Convention at Cleveland in January, and Ivan Boyce elected as alternate. O. O. Manning, President of the Freezer Journal, extended an invitation to the members to attend the Birmingham, Ala. Christmas party, and gave a short talk about the object of his trade paper. On the educational program, V. P. Warren gave a very instructive talk on the present trend in display cases, stating that this phase of refrigeration is still in its infancy and predicted there would be better and better equipment coming off the production lines with as much advancement in the next 15 years as there had been in the past 15 years on domestic refrigeration equipment.

● BOSTON CHAPTER, *Boston, Mass., Oct. 22*—There were 101 members present at this meeting, and during the business session, nine new members were accepted to membership. A nominating committee consisting of Gerald Bradford, Bert Stenmark and Charles Galli was appointed to pick a slate of officers for the coming year and report at the next meeting. C. W. Nelson of Wentworth Institute gave a short talk and complimented the chapter on its fine meeting attendance. On the educational program Charles Galli, Chairman of the Educational Committee, introduced Earl Jennings of Temprite Products Company, who gave a very instructive talk, at the end of which a question and answer period was conducted and service manuals were passed out to the members. A rising vote of thanks was extended to Mr. Jennings on the completion of his talk for his contribution to the success of the meeting.

● CANTON REGIONAL CHAPTER, *Canton, Ohio, Nov. 18*—Visitors at this meeting included George Schuld and Dick Hollingsworth from the Cleveland Chapter, Orra Nichols from Medina Chapter, and three members of Akron Chapter. Business was dispensed with due to the numerous guests, and Orra Nichols of the Buckeye State Association was introduced. Mr. Nichols gave a short talk on the Association's activities, bringing attention to a jingle contest, a BSA paper and a future convention in April. The next speaker was Mr. Hollingsworth who talked briefly about the International Convention at Cleveland, which will include tours through Jack & Heintz, Weatherhead and possibly the NACA, and also a display of service trucks. George Schuld of Cleveland, held the attention of the audience with a very interesting talk on safety. The meeting was then turned over to Earl Jennings of Temprite Products Corp. Mr. Jennings displayed various Temprite coolers, floats and valves and oil separators and gave a discussion on each. The talk was very educational and included the most important service factors from the service viewpoint.

● CENTRAL ARIZONA CHAPTER, *Phoenix, Ariz., Nov. 11*—The members voted to send flowers to Bill McLaughlin who is ill in a hospital. The educational program for the next meeting was discussed and Fred Perry, Chairman of the Educational Committee, said he believed he could arrange for a speaker. The meeting was then turned over to Frank Carter of the Detroit Lubricator Company who gave a very interesting talk on superheat in relation to expansion valves. The talk was enjoyed by all those present.

● CENTRAL PENNSYLVANIA CHAPTER, *Harrisburg, Pa., Nov. 20*— President LeFevre requested that two members who already made reservations for the International Convention at Cleveland, volunteer to act as delegate and alternate for the chapter. Mr. Haas

METROPOLITAN CHAPTER DEDICATES BANNER

On November 28, Metropolitan New York Chapter conducted ceremonies dedicating an attractive banner presented to the chapter by several business men. Pictured in the photograph at the left is Fred Asselmeyer following the formal dedication. Upper right photo shows President Asselmeyer and Sam Hammer, responsible for securing the donations for the banner.

Lower right photo, the officers and directors of the chapter grouped around the banner. Seated: Director, Irving Arnold; Sergeant-at-Arms, Emanuel Parish; Director, Daniel Salin; Reporter, Paul Steinberg and Director, Gus Meinhardt. Standing: Secretary, Donald Whyte; First Vice-President, Jack Firester; Director, Fred Worthington; Second Vice-President, Bernard Krasner; President Fred Asselmeyer; Director, Sterling Graves; Chairman, Investigating Committee, William Spellman; Director, Peter Pilko and Treasurer, Morris Robinson.

and Mr. Hostetter offered their services. President LeFevre then thanked Russell Jones, Sr. for having a public address system installed for the meeting and also for the door prize which he so generously donated. H. M. Laird of Ranco, Inc. was the speaker of the evening. He started his talk by congratulating the chapter on its recent organization and expressing his thanks for being chosen as the first speaker on the educational program. He then went into a very interesting discussion of the repair, adjustment, application and handling of controls. Door prize was won by Mr. Karlavage.

● FLORIDA WEST COAST CHAPTER, *Tampa, Fla., Nov. 13*—George A. Benke was elected Secretary to take the place of W. A. Bingham, Jr., who found it necessary to resign. Arthur B. Haverstock was then elected Sergeant-at-Arms to fill the vacancy left by Mr. Benke when he took over the Secretary's duties. On the educational program, Fred Graves introduced a representative of Alco Valve Company who gave a very good talk on a new two temperature snap action suction line valve by Alco. This was followed by the showing of the film "The Adjustment and Repairs on Thermostat Expansion Valves" and two additional pictures on sports and travel.

● GOLDEN GATE CHAPTER, *San Francisco, Calif., Nov. 19*—This was one of the most outstanding educational meetings of the year for this chapter and was enjoyed by 82 members and guests. Frank Carter, the speaker on the educational program, was introduced by E. J. O'Connell of Los Angeles. Mr. Carter gave a most instructive talk on the fundamental principles and operation of expansion valves, both automatic and thermostatic. A 14 lb. turkey, given away free as a door prize, was won by Bruno Farich.

On December 5th, about 30 members of the Oakland and Golden Gate Chapters enjoyed a Christmas party held at the regular meeting hall. During the early part of the evening a Bingo game was enjoyed by all, after which the drawing was held for the automatic toaster. F. F. Sullivan of San Francisco was the lucky winner. Names were then exchanged and the gifts passed out during the refreshments which followed. An announcement was made that a 7 cu. ft. Frigidaire would be raffled off at the regular meeting of this chapter on February 24.

● GRANITE STATE CHAPTER, *Manchester, N. H., Nov. 18*—The meeting was preceded by a delicious Yankee pot roast dinner enjoyed by 31 members. During the business meeting, Joseph Blanchet, Udgere Stokes, Philip Morin and Gerry Tessier were appointed as a ways and means committee. Harry Cobe, President of the chapter, was elected delegate to the International Convention. The meeting was then turned over to Mr. Hall who introduced the speakers of the evening, Mr. Nicholson of Airco Sales, Mr. Webber of Handy & Harman, and Alden Smith of the same company. Then followed a very interesting and educational talk on low temperature brazing or silver soldering, including a complete demonstration, which was enjoyed by the entire meeting.

● GREENVILLE, S. C. CHAPTER, *Greenville, S. C., Nov. 12*—During the course of this meeting, four new applicants were accepted to membership. They are: Vance Fowler, Wriston Smith, John Kay and V. Kennimore —the first three as junior members and the last as an active member. A discussion was held regarding thermometers for household boxes with an RSES advertisement on it, to be ordered and sold to the servicemen at 50c each to sell or give to their customers. Bill Durham volunteered to cut a stencil and make up a sample letter to be sent to bad debt customers to aid collections.

● HEAD OF THE LAKES CHAPTER, *Duluth, Minn., Nov. 3*—Five new applicants were approved by those present for membership and the entire meeting was devoted to business of the chapter.

At the December 6th meeting, the election of officers was held with the following results: Robert W. Alvar, *President;* William Draxton, *1st Vice-President;* Harry Luck, *2nd Vice-President;* Roland C. Ely, *Secretary-Treasurer;* Herbert S. Stott, *Recording Secretary;* Frank Tubbs, *Sergeant-at-Arms.* Directors—Robert E. Rooney, Roy Hammerstedt and Robert G. Bell. Those elected will take office at the next regular meeting.

● INDIANAPOLIS CHAPTER, *Indianapolis, Ind., Oct. 14*—The major portion of the evening was taken up with chapter business, after which a question and answer period was held. The attendance prize—a Hinsdale socket set—was won by Mr. Salter.

On October 28th a special meeting was held, at which time President Hartzog introduced Col. Rassmusson and Capt. Preston, members of the U.S. Army and representing the Organized Army Reserve Corp., who spoke about sponsoring a mobile truck unit of refrigeration servicemen who had served in the last war. More details will be presented at a later date. The meeting was then turned over to Mr. Myers of Alco Valve Company, who gave an interesting talk on Alco products, showing a new line of valves they were making for the refrigeration industry. Refreshments were served following the meeting.

● JOPLIN CHAPTER, *Joplin, Mo., Nov. 17*—During this meeting Joe W. Ables was elected delegate, and Austin Longstreet alternate to the International Convention in Cleveland. On the educational program, a representative of Mueller Brass Company gave a comprehensive lecture and demonstration which was thoroughly enjoyed by the audience, after which refreshments were served.

● KEY CITY CHAPTER, *Dubuque, Iowa, Dec. 3*—The chapter's pre-Christmas party was held at the Chateau Antone on this date. The out-of-town guests present included George Lick of Mills Industries, Woody Larson of Thermal Co. Inc., M. R. Stuhlsatz of Cherry-Burrell, and E. P. Blood of Installation Sales Co. James Moravec of Penn Electric Switch Co. was the guest speaker of the evening, illustrating numerous applications of Penn Products with the aid of colored films. Dubuque-land's marvel at magic, Ken Kilby, held the audience spellbound with his many tricks and magic. A chicken dinner was served at

10:00 p.m., after which attendance prize was awarded. All in attendance enjoyed a gala evening.

● MIAMI CHAPTER, *Miami, Fla., Nov. 12*—The meeting was called to order by 1st Vice-President P. E. Richie, in the absence of President Dick Turpin. Letters that had been sent to prospective city commissioners and editor of a newspaper requesting them to attend a meeting for the purpose of promoting a refrigeration and air conditioning code for Miami, were read by J. D. Nall of the Legal Affairs Committee. Various committees were appointed for a proposed Bar-B-Que, and some action was taken regarding the election of a delegate and alternate to the International Convention. After the conclusion of the business session, O. W. Brown presented a discussion of current refrigeration and air conditioning problems.

● MONTGOMERY CHAPTER, *Montgomery, Ala., Dec. 4*—Election of officers was held on this date, with the following being elected: J. M. Manley, *President;* L. T. Williams, *1st Vice-President;* J. A. Hale, *2d Vice-President;* R. M. Bedsole, *Secretary;* Wilbur Price, *Treasurer;* S. B. Goodwin, *Sergeant-at-Arms;* and J. B. Harris, *Chairman of the Educational Committee.* The educational program consisted of a film on copper and its alloys, shown by the Reserve Copper & Brass, Inc. Refreshments were served after the meeting.

● ONTARIO MAPLE LEAF CHAPTER, *Toronto, Ont., Nov. 21*—K. Wood reported that considerable progress had been made regarding the Apprenticeship Act and that everything possible is being done toward bringing this Act to a successful conclusion. The Secretary reported that the I.P.A. Conference would be held March 30 and 31, and arrangements were being made to hold the annual banquet and dance on March 31st in conjunction with the Conference. On the educational program, A. E. Doan presented A. F. Sawyer of Dole Refrigeration, whose subject was "Estimating Low Temperature Loads and Sizing Equipment." This interesting talk was appreciated by all those attending, and G. A. Burns thanked the speaker on behalf of the members and friends present.

● PROVIDENCE CHAPTER, *Providence, R. I., Dec.*—The speaker of the evening was C. H. Smith, representing the Hubbel-Yoder line of refrigeration plates. Mr. Smith showed pictures of how these plates were constructed and how the refrigerant traveled to avoid pressure drops and oil traps. He also explained the adaptability of the plates and the ease with which they are maintained.

● SACRAMENTO VALLEY CHAPTER, *Sacramento, Calif., Nov. 6*—Visitors present were Bud Munpower and Bill Hesty of Crystal Creamery; C. R. Robinson, C. R. Ernest and Charles Sheldon of John Breuner Co., and Roy Bybee of Bybee Refrigeration. A committee appointed by President Allyn Schoen to further investigate and promote a refrigeration code for the city and county of Sacramento, included Dick Oeberst, Chairman, and Jean Rauzy. Refreshments were served following the meeting.

● ST. LOUIS CHAPTER, *St. Louis, Mo., Nov. 18*—After the regular business meeting, President Vizgird introduced the speaker of the evening, A. L. Golay, representing the Kold-Hold Mfg. Co. Mr. Golay explained the construction of Kold-Hold products, calling attention to improvements that have been made and commenting on the increased use of refrigerated trucks. Slides of various truck installations were then shown. Following his talk, Mr. Golay answered questions from the floor and distributed Kold-Hold literature. Attendance prize winners were L. A. Ross, J. Kovan and L. J. Schadler. Refreshments wound up the evening.

● SAN DIEGO CHAPTER, *San Diego, Calif., Nov. 28*—Due to the illness of President M. R. Hanks, the meeting was taken over by Vice-President Fickler. This illness broke a five-year attendance record for Mr. Hanks. A welding jamboree was held after the business meeting, with all members participating. The Eutectic Welding Alloys Corp. furnished all the necessary material.

● SOUTHERN TIER CHAPTER, *Elmira, N. Y., Nov. 20*—Four applicants were approved for membership, namely, Donald Wilson, John Hysong, George Spink and Thaddius Szazurek. K. Krug was elected delegate to the International Convention and H. Pickel, alternate. The educational program included Mr. Bissett of the Lehigh Foundries of Lancaster, Pa., and also Charles Barry, who was the principal speaker of the evening. His topic was the world series of 1947.

● TRI-COUNTY CHAPTER, *Joliet, Ill., Nov. 15*—Harold Ellis presented Bill McCarley with a gift of a new gavel to assist him in keeping order at the meetings over which he will preside as President of the Illinois Association. Mr. Ellis reported the election of B. V. Clark to the office of Secretary of the State Association, the position formerly held by Robert E. Saunders. Following this, Willis Stafford was elected to represent the chapter for the term of one year, on the State Board of Directors.

● WESTCHESTER CHAPTER, *Mt. Vernon, N. Y., Nov. 20*—During the business meeting, M. Kravitz, M. DiChiara, L. Bellino and J. M. Cariello were elected to membership. The meeting was then turned over to Chas. C. E. Harris, International 2nd Vice-President, who presented the charter to the chapter, giving the obligation of membership, and an interesting talk on the aims and purposes of the Society.

● WESTERN MASSACHUSETTS CHAPTER. *Springfield, Mass., Nov. 11*—Applications of P. F. Eardi and J. F. Pielka were voted on and accepted to membership. The subject of a delegate to the International Convention was brought up and Frank Meyer was elected to serve as such. The balance of the evening was devoted entirely to business matters.

● WOLVERINE CHAPTER, *Lansing, Mich., Nov. 24*—After numerous business matters of the chapter had been decided upon, Sidney Ferrin and Rial Kellogg were elected delegates to the International Convention in Cleveland. There being no further business to discuss, the meeting was adjourned and refreshments were served.

NEW AND IMPROVED EQUIPMENT

Water Coolers

A COMPLETE line of seven hermetically-sealed water coolers to meet every commercial, institutional or industrial need will be introduced early this year, according to Mr. H. F. Hildreth, Manager, Refrigeration Specialties Department of the Westinghouse Electric Corporation, East Springfield, Mass.

Significant is the fact that many of the added features of the new line have resulted from suggestions obtained from an extensive market analysis, in which detailed questionnaires were sent to owners inviting criticisms on the former Westinghouse water coolers.

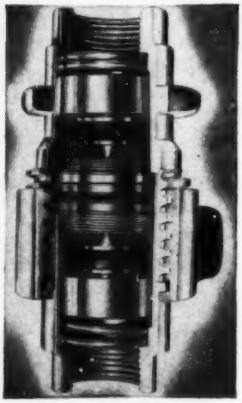
Features adopted and built into the new line include: automatic pressure regulator for maintaining constant stream height regardless of variations in local water pressure; new type orifice on bubbler to prevent squirting and malicious water damage; foot pedal operation for convenience and sanitation; removable front panel for easier access to all mechanical parts.

All the coolers have blue-gray enamel finish. Except for one China top model, all units have one-piece, splash-proof tops of stainless steel, and have provision for adding chrome plated glass filler. A 14 by 14 inch base is standard with all models in the line. With one three-gallon bottle type unit, the line of pressure coolers varies from the 3½ gallon size for locations with light traffic, to the 22½ gallon capacity for extra heavy duty such as open hearths, steel mills, foundries, car shops, etc.

Every cooler is backed by the Westinghouse five-year protection plan.

Coupling

THE new Quick-Disconnect Coupling, developed early this year for use on Freon refrigeration units and field tested since May, is now being marketed by Paxton-Mitchell Co. of Omaha, Neb.



Although originally designed to provide a means of rapid changeover of air conditioning units on railroad passenger cars, further market exploration has found the product applicable also to other types of service—such as air, gas, and hydraulic systems.

Fabrication from extruded brass bar stock eliminates the possibility of porosity which might result in leaks. Fast Acme thread permits rapid opening of the union joint; dual valves which are self closing as the union joint is broken and amply guided to prevent possible cocking in the guides, increase the efficiency of the coupling. Engineering and design of the unit provide for relieving of pressure between the valves while being disconnected and for trapping only a minimum of air between the valve seats when making up the union. Valve seats are of Freon-resistant Neoprene and for replacement purposes, are easily removable.

This new coupling is now made in ½, ¾, 1, and 1½ in. sizes and all sizes permit in excess of 100 per cent of pipe capacity for equivalent sizes. All units are compact and light in weight. Perfect seal is easily made under highest pressures encountered in Freon refrigeration systems. The new coupling is readily adaptable to air, water, gas, oxygen, instrument, fuel, oil lines application; cooling, testing, refrigerating, lubricating, heating, air conditioning, processing, maintenance, truck trailers and many other operations and applications. It has been in actual service on transcontinental streamliners since May and has proven a great advantage in making possible rapid changeover of refrigeration units without the necessity of pumping down the unit and in saving of Freon.

Mounting Spring

A NEW low-cost vibration control unit, the Korfund Type RS Conical Rubber-Spring Mounting, has been announced by The Korfund Co., Inc., Long Island City 1, N. Y.

The Type RS has a high

load capacity, ranging from 25 to 125 lbs. per unit. The conical spring design provides greater horizontal stability than conventional all-rubber mountings. This means smoother operation, particularly during starting, and frequently eliminates the necessity for snubbers or flexible connections.

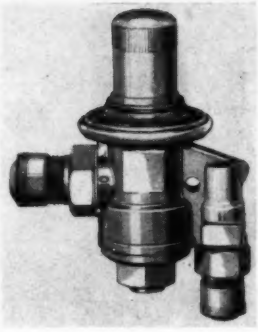
This combined use of rubber and steel springs not only increases the load capacity but also gives the Type RS a wide frequency range for successful isolation. It is equally effective for pumps operating at 1750 RPM, as well as compressors running at 450 RPM.

The new Korfund Type RS has been designed primarily for use on compressor units, generator sets, motor generators, pumps, motors, fans and other machinery requiring a highly efficient, economical, standardized vibration isolator. Please write for further details and Korfund RS Bulletin.

Expansion Valve

A NEW 1-ton automatic expansion valve, the AP 304, is being released to the industry by the Automatic Products Company this month.

AP 304 is used on systems where loads remain fairly constant. Typical applications include milk coolers, water coolers, beverage coolers, medical refrigerators, candy cases, sharp freezers, two-temperature cabinets, and



low temperature testing cabinets.

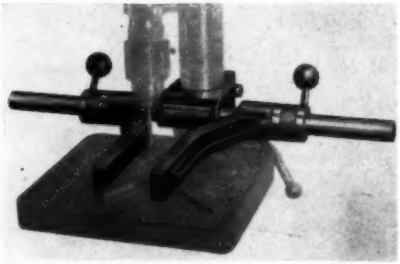
Twelve construction features of the AP 304 are:

1. Velvet finished ball type needle is self-adjusting, eliminates sliding friction. Floating construction means smooth, fast closing.
2. Valve seat is stainless steel, precision finished to close tolerances.
3. Diaphragm lasts, because it's beryllium copper. Design of diaphragm increases sensitivity.
4. Soft, pure electrolytic copper gaskets provide moisture-tight seal. Because it's pure, copper retains resiliency.
5. Dense brass body is forged, not cast. No refrigerant loss, because there are no leaks.
6. Rubber sealed metal cap is moisture-proof, prevents freeze-ups in head.
7. Full range of adjustment from 15" vacuum to 35 lbs. pressure.
8. Large area brass strainer keeps valve clean.
9. Springs are stainless steel, pre-tested for correct tension. Non-corrosive to give smooth lifetime service.
10. Wrench pads at inlet and outlet and on valve body simplify installation. No danger of marring or injuring valve.
11. Mounting hole simplifies installation when valve needs support.
12. Fine thread on adjusting knob assures close adjustment to proper pressure reading.

The same valve is used for Freon, Methyl Chloride and Sulphur Dioxide.

Complete information on the AP 304 Automatic Expansion Valve may be obtained from leading wholesalers or direct from Automatic Products Company, Milwaukee 10, Wisconsin.

Drill Press Work-Holder



DRILL press accidents are prevented, quality is improved and production is increased with the new safety work-holder developed by Universal Vise & Tool Co., Parma, Mich. This new work-holder quickly clamps to the column of any small standard drill press, and instantly secures the work with only a quarter-turn of a single lever.

In many cases, this new tool can substitute for simple drill jigs, thus simplifying tooling and cutting costs. By replacing makeshift devices such as bolts and C-clamps, it enhances safety and increases accuracy. The clamping arms are instantly adjustable along the length of the cross arm to encompass the full width of the drill press table and are quickly swung back to clear a drill jig or machine vise when necessary. Standard sizes fit drill presses with columns of 1⅝, 2¼, 2¾, 3, 3½, 3¾ or 4 inch.

FREEZER SENTRY

A PROFITABLE "Push Over" SALE ON EVERY FREEZER SERVICE CALL

● Every owner of a home freezer needs this signaling device to insure quick warning of mechanical failures. Every day more freezers are being serviced in your area. You do the servicing. You know the owners. They need the Freezer Sentry.

Here is Why You Should Sell the Freezer Sentry

A package item. Installed in two minutes.

●

Positive action. No thermostat. A drop of mercury makes the contact.

●

Battery operated. Trickle charger insures 5-year battery life and 100 hours buzzer operation.

●

An extra good profit margin for you.

Immediate delivery. Write today for descriptive material and price sheet.

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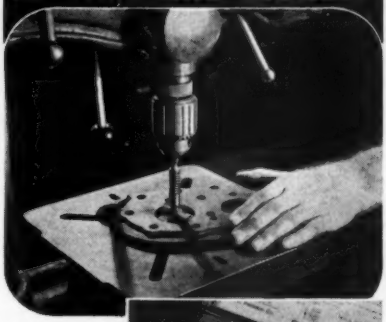

Now

YOU can reoperate valve plates ON THE JOB or IN THE SHOP . . . Quickly, Easily!

Yes, this amazingly low-priced kit makes it easy for any experienced refrigeration service man to grind, finish and test recessed or flush valve seats (either piston or flapper jobs). Speeds up work, saves buying new parts. No more tiresome hand-lapping.

THE PREMIER VALVE GRINDING KIT Pays for Itself by Reoperating as Few as 6 Valve Plates!

All equipment necessary for handling ½" to 1¼" valve seats, plus complete instructions, come packed in compact, hinged case.

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NEWS OF THE EQUIPMENT INDUSTRY

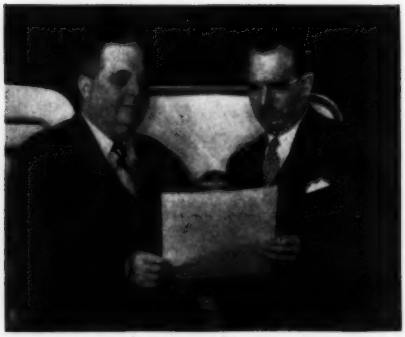
LEONARD REFRIGERATORS CITED FOR "PUBLIC SERVICE"

MORE than 60 years of public service by Leonard, the oldest name in household refrigeration, won special recognition recently.

Leonard, division of Nash-Kelvinator Corporation, founded in Grand Rapids in 1881, introduced the first "cleanable" ice refrigerator. Today it manufactures electric refrigerators, ranges and home freezers.

A "certificate of public service" was presented at the company's national sales meeting by Henry E. Abt, president of Brand Names Foundation, acknowledging the services of products the public has "continued to patronize and trust for 50 years or more."

It was the first such award in the refrigeration industry.



George W. Mason, president (left), Nash-Kelvinator Corporation, accepts from Henry E. Abt, president of Brand Names Foundation, citation honoring Leonard Division of the company for public service.

The citation reads: "Brand Names Foundation, in recognition of continuous service to the American people since 1881, awards to Leonard, for refrigerators . . . the golden anniversary certificate of public service. Given to brand names which have been tested by the judgment of the American people for 50 years or more and have won and held public confidence through unfailing integrity, reliable quality, and fair pricing."

Explaining the reasons for recognizing brand names, Abt said: "Brand naming, or open forthright identification of the maker of products, is one of the healthiest, most wholesome features of the American way of life. We believe this, more than any other practice, guarantees the continuation of the high living standards that make our country a better place in which to live.

We know that any name that can survive the exacting scrutiny of the public, year in and year out; and maintain the confidence of dealers and consumers must inevitably have performed an immeasurable public service."

* * *

NEW PRESSURE-TEMPERATURE WALL CHARTS PUBLISHED

TWO wall or desk charts covering the saturated Pressure-Temperature Relationships of refrigerants have been recently compiled and published by Kinetic Chemicals, Inc.

For some time there has been a demand and need for suitable charts or curves which would cover not only the eight "Freon" refrigerants being currently produced but also eighteen additional chemicals that are being or have been used in the past by the air conditioning, household, commercial, or industrial refrigeration industries. The form of Pressure-Temperature Chart decided upon was the result of carefully investigating various forms and sizes of charts that had previously been prepared for use and also from the many expressions received from engineers and users of such data within the industry.

These new Pressure-Temperature Charts are approximately 23″ x 26″ in size, printed in black on white. Chart I covers the temperature range of —40 F. to 250 F. and Chart II covers the range of —180 F. to 60 F. with the pressure ranges of both charts from 29.72 inches of mercury vacuum (.1 lb. per sq. in. abs.) to 985 lbs. per sq. in. gage (1000 lbs. per sq. in. abs.). The two charts covering the two ranges of temperatures

were prepared to permit of more accurate and rapid temperature readings being made; and also wider fields of pressures and temperatures are covered than by any chart previously made readily procurable.

The charts accurately represent the data appearing in the literature and sources of such data will be given upon request. Copies of these charts are available to the engineering profession, refrigeration trade, and for classroom work, or for those that may have occasion to use such data.

LYNCH CHANGES 4 MODELS

PAR Condensing Unit Models HA2, HA3, HA5, and HA7—¼, ⅓, ½, and ¾ h.p. heavy duty units, respectively, have been restyled for 1948 as closer-coupled units and require far less space when used for self-contained applications. These 4 models are designed for self-contained or remote applications and are equally efficient for either.

These models as well as the regular Par close-coupled models and Par heavy duty commercial models will be displayed at the Fifth All-Industry Exposition at Cleveland in January—Booths No. 102 and 201.

FRIGIDAIRE TO CONDUCT SERIES OF A.C. SCHOOLS

A SERIES of five-day Regional Air Conditioning schools, geared to the Company's current nation-wide expansion program, will be conducted by Frigidaire Division of General Motors for district and dealer engineering personnel throughout the country during December and January, according to an announcement by W. F. Switzer, Commercial Sales Manager.

The first training period has already been held by the Central region, in Dayton. Similiar schools scheduled to follow in four other key cities include: Southwestern region at Forth Worth, Tex., Dec. 8; Pacific region at Oakland, Calif., Jan. 5; Eastern region at New York City, Jan. 19, and Southeastern region at Atlanta, Ga., Jan. 26. Training courses will be in charge of a factory team, comprised of E. J. Boyer and R. Woodward, air conditioning sales representatives.

Designed to prepare the field organization for a greater volume of air conditioning business in times to come, the schools are the first to be conducted by the Company since before war days. The courses, comprehensive in nature, will cover "Fundamentals of Air Conditioning," including such phases as "Theory," "Air Distribution," "Determining Refrigeration Loads," "Selection of Equipment," "Product Application" and "Installation."

"In reality," Switzer declared, "Frigidaire is girding itself for the competitive days ahead in the air conditioning business. The Company is placing special emphasis on production of room conditioners, store conditioners and central systems. We intend to move ahead progressively in these three fields."

CENTRAL R.E.W.A. GROUP ELECTS NEW OFFICERS

AT THE last meeting of 1947 the Central Refrigeration Wholesalers Association Regional Group 6 held their election of officers for the 1948 season. The officers elected are as follows:

Chairman: R. M. Potter replacing L. C. Keely. Vice Chairman: P. Ravanesi replacing R. M. Potter. Treasurer: G. A. Larson replacing I. Alter. Secretary: V. J. Sweeney replacing P. Ravanesi.

I.H.C. APPOINTS VICTOR IN DETROIT

APPOINTMENT of R. C. A. Victor Distributing Corporation, 1930 East Jefferson Street, Detroit, as wholesale distributor of International Harvester refrigerators and freezers has been announced by International Harvester Company, Chicago. The Detroit territory includes Oakland, Wayne, McComb, Monroe and Washtenaw counties in Michigan, and the city of Toledo and Lucas County in Ohio. L. W. Kanaga is vice president and general manager of the Detroit branch of R. C. A. Victor, and E. V. O'Hara is home appliance sales manager.

The Detroit appointment is second of its kind by International Harvester within a few weeks. The first was Bruno New York, Inc., to serve that metropolitan area.

Production Increases

Output of International Harvester's big new refrigeration plant at Evansville, Indiana, continues to grow with two sizes of home freezers—4-cubic-foot and 11-cubic-foot—already in quantity production. A larger freezer will be available soon. Harvester's new 1948 refrigerator line, three 8-cubic-foot models—standard, deluxe and super deluxe—will be in the hands of dealers shortly after January 1.

THE LIQUID EYE

- Eliminates Pressure Drop . . .
- Light, sturdy construction . . .
- Positive reaction of indicator.
- Pyrex tubing insures safety . . .
- Proven under field conditions . .
- Pliable gaskets, impervious to Methyl Chloride, Freon-12, and Refrigerant Oils . . .

Order this LIQUID EYE from your jobber now

ALLIN MFG. CO.
4025 Armitage Avenue
Chicago 39, Illinois Phone: CAPitol 8454

Speed Service Jobs with IDEAL "Hand-Type" CLEANER

Improved Ideal "Hand-Type" Cleaner blows matted dirt from condenser unit.

4-in-1 MODEL

FAST, POWERFUL

Get fast thorough cleaning of condenser units and other refrigerator parts with the improved Ideal "Hand-Type" Cleaner. Easily portable, weighs only 14-1/2 lbs.—but it's the most powerful hand cleaner made!

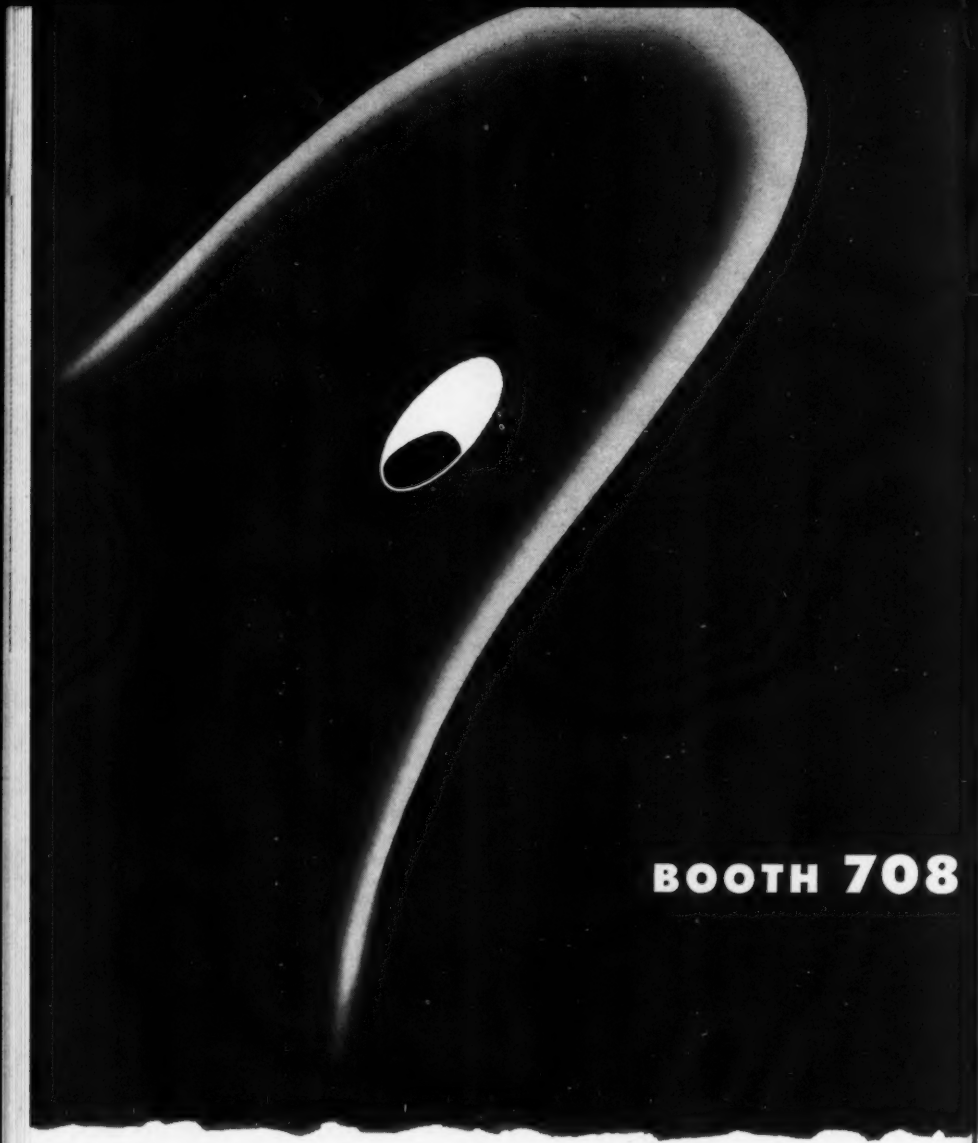
A continuous duty 1-1/3 H. P. motor blows dry air at high velocity to blast out every particle of dirt. Makes short work of difficult cleaning jobs. Can also be used to vacuum — gives same high power for suction cleaning.

SAFE, EASY TO USE

The Ideal "Hand-Type" Cleaner is perfectly balanced for convenience in operation; has thumb switch for instant power control. Fan chamber points away from operator, clothes won't catch in the intake. Can be used for spraying or drying — attachments are quickly interchangeable. (Available in medium duty model also—2/3 H.P., 9-1/2 lbs.) Manufactured by IDEAL INDUSTRIES, Inc., Sycamore, Ill.

IDEAL **Ask for Free Demonstration**

Distributed Through
AMERICA'S LEADING WHOLESALERS
Canadian Distributor: Irving Smith, Ltd., Montreal



It's a date . . . Booth 708 . . . for a preview showing of several new model hermetics using Freon 12 and 22. Fifth Annual All-Industry Refrigeration and Air Conditioning Exposition . . . Cleveland Public Auditorium . . . January 26 through 29.

TECUMSEH PRODUCTS COMPANY

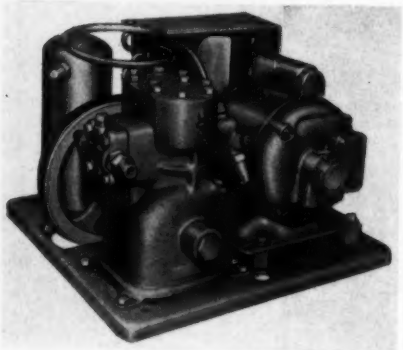
Tecumseh, Michigan

UNIVERSAL COOLER PLANS LARGE EXHIBIT AT ALL-INDUSTRY SHOW

PLANS for the largest exposition display in the history of Universal Cooler Division, International Detrola Corporation of Marion, Ohio, were announced recently by J. P. Scott, Director of Sales, in commenting on the company's participation in the All-Industry Refrigeration and Air Conditioning Exposition to be held in the Cleveland Public Auditorium January 26-29, 1948.

Universal Cooler has reserved four adjoining booths for the exposition and is now in the midst of preparing a colorful exhibit which will touch on every phase of the company's products and services.

Two outstanding Universal Cooler developments will be shown publicly for the first time in connection with the exposition.



Universal Cooler Condensing unit.

One of these is a new air cooled condenser which Universal Cooler has developed and which is now in production at its Bellefontaine, Ohio, plant. This air cooled condenser differs radically from those of conventional design and construction. Thin sheets of copper-clad steel are die-stamped in such a way that they become not only fins for the condenser but also a short section of tubing. When layers of these die-stamped sheets are assembled and brazed in an electric furnace the result is an air cooled condenser which is of virtually integral construction. Because the fin and tube are actually a single piece of metal, a 100% heat transfer is obviously obtained through this method of construction. Rigid laboratory tests indicate an increase of 10% efficiency over condensers of conventional design.

Another new Universal Cooler development to be shown at the exposition consists of three new hermetic units which supplement and strengthen the Universal Cooler line of hermetically sealed units, enabling the company to offer a range of sizes which will cover virtually every possible application.

Condensing units to be displayed will be representative of the company's three types of units: hermetics, self-contained and remote units. Remote units are manufactured in both air cooled and water cooled models.

One portion of the display will be devoted to Universal Cooler's nationwide service parts jobbers organization which consists of 160 representatives strategically located throughout the United States.

Mr. F. S. McNeal, Vice President and General Manager, will head a sizable group of Universal Cooler officials, department heads, and sales and service representatives planning to attend the exposition.

As usual, Universal Cooler plans an open house for their friends at the company's hotel suite.

The company's exhibit will occupy Booths 127-129-131-133 in a curved area near the bottom of the main stairway leading to the exhibit area.

S S S

HONEYWELL NAMES WARMEE MODUFLOW SALES MANAGER

Roy H. Warmee has been appointed sales manager of the Moduflow division, Minneapolis-Honeywell Regulator Company, Thomas McDonald, vice president, announced recently.

Sales promotion manager for the company since 1940, Warmee is widely known throughout the heating industry. A native of Pittsburgh, he attended the University of Buffalo and the University of Pennsylvania, specializing in merchandising and advertising.

Joining the sales department of the Koppers Company in Pittsburgh in 1925, Warmee was made Philadelphia sales manager for that organization four years later, retaining that position until joining Honeywell.

Warmee is regional director of the National Federation of Sales Executives and president of the Minneapolis Association of Sales Managers. A writer and lecturer on sales subjects, he was the first winner of the Howard G. Ford award for outstanding achievement in sales management. The

award is sponsored by the Wharton School of the University of Pennsylvania, the Sales Managers' Association of Philadelphia and the National Federation of Sales Executives. He also has won the Edmand F. Mair trophy, sponsored by the Minneapolis Association of Sales Managers for "outstanding service to Minneapolis sales management."

John Randall, who has been serving as temporary manager of the Moduflow division, has resigned to take a position with another company. Sales promotion activities, formerly supervised by Warmee, will henceforth be managed by John A. Young, who has been serving as assistant in the department.

J. D. Nall, Hoosier Service Co., Miami, Florida, with his new Piper Cub plane. Mr. Nall, who is a flying enthusiast, says it saves him a lot of time in picking up parts from other cities and he has fun doing it, too.

SCHNACKE INC. OFFERS PRICE PROTECTION

IN A recent trade announcement, Schnacke Inc., Evansville, Ind., endeavors to do something about price stabilization. Recognizing that it is difficult to forecast what may happen in material and labor costs, the company will, nevertheless, protect customers on published prices for a sixty-day period. Future price changes, if any, will be effective only upon sixty-day advance notice.

In the announcement to its customers, the company stated "It must also be borne in mind that the future is still uncertain both in regard to higher prices, and particularly now, with a shortage of steel and materials again threatened. It should be remembered that pig iron and steel are right now in shorter supply and with this thought in mind, you should be able to close sales where procrastination and the possible thought of lower prices have delayed the actual order."

ETHERIDGE NEW PARTS SALES MANAGER FOR NASH-KELVINATOR

APPOINTMENT of G. T. Etheridge as sales manager, wholesale commercial and parts department, Kelvinator Division, Nash-Kelvinator Corporation, was announced recently by C. T. Lawson, vice-president in charge of sales.

G. T. ETHERIDGE

Etheridge, who has been in the commercial refrigeration sales field since 1933, has been assistant manager of Kelvinator's contract condensing unit department since 1944.

He joined the Pittsburg zone of the division in January, 1941, in the commercial department and two years later was named commercial parts and service manager.

HOTPOINT ANNOUNCES NEW COMBINATION REFRIGERATOR

A NEW two zone combination refrigerator-freezer, which permits dealers to demonstrate a complete home freezer and a high humidity refrigerator by opening a separate door to each compartment, is being shipped to distributors and dealers by Hotpoint, Inc. Known as Model EG-8, the combination unit heads the 1948 Hotpoint line which also includes conventional type refrigerators incorporating improvements and added built-in values designed to increase dealer business volume.

In addition to the combination refrigerator-freezer, a standard 10 cubic foot model, the EA-10, has been added to the 1948 line, L. C. Truesdell, vice-president of marketing, noted.

The two zone refrigerator is regarded by Hotpoint engineers as one of the most important advances in home refrigeration in many years. This model will retail for $399.75. Consumer acceptance for the refrigerator-freezer has already been confirmed by a recent Hotpoint survey which revealed that consumers would buy the combination unit in preference to a standard refrigerator, according to the opinion of 65 per cent of the dealers in all sections of the country.

The EG-8 is divided into two compartments: the upper for freezing and storage of frozen foods, and the lower for normal refrigeration storage. The over-all storage capacity of 8.2 cubic feet (6.7 for the refrigerator, and 1.5 for the freezer) is contained in a unit occupying no more kitchen space than the pre-war six cubic foot box. Since the average homemaker opens her refrigerator approximately 50 times a day, and the home freezer only two or three times, Hotpoint engineers believe that the two door design is essential for maintaining correct refrigeration and freezing temperatures. Both compartments are equipped with automatic lights.

A conditioner which maintains butter spreading consistency is one of the features of Hotpoint's new two door combination refrigerator-freezer, Model EG-8. A 52-pound capacity home freezer and a high humidity refrigeration compartment are combined into a single unit of eight cubic feet and occupying no more kitchen space than former six cubic foot models.

The freezer compartment, in effect, is a miniature home freezer with all the features necessary for freezing and preserving 52 pounds of food. The temperature is maintained at 0 degrees Fahrenheit or lower, and defrosting for this compartment is necessary approximately twice a year.

Space in the refrigerator storage compartment has been greatly increased in the EG-8 through the elimination of the conventional evaporator unit. The conventional unit has been replaced by a flat plate type located in the refrigerator walls, an arrangement which makes possible maintaining a humidity of 80 per cent. Because of its high humidity feature, the EG-8 will conserve food freshness for longer periods than the conventional refrigerator, Hotpoint engineers said, adding that drying out of uncovered foods is minimized. Defrosting of this compartment is automatic and needs no attention.

Among the deluxe features of the EG-8 are the two fruit and vegetable sliding drawers in the bottom of the refrigeration compartment. Humidity in these drawers approaches 90 to 95 per cent. A butter conditioning compartment with a temperature control keeps butter at spreading consistency. A stainless steel rack on hinges contains three jars for leftovers. All shelves in the refrigerator section are of stainless steel, and interior walls are lined with acid resisting porcelain to facilitate cleaning.

S S S

NEW CATALOGS AND BULLETINS

CHASE REFRIGERATION SUPPLY CO., Chicago, Ill., have issued a new four-page compressor exchange supplement to their parts catalog. Covering Copeland, Brunner, Mills, Universal Cooler and Chieftain compressor, the bulletin is designed for the customers' convenience in ordering a compressor to replace a bad one in operation.

SOUTH BEND LATHE WORKS has just issued the 45th edition of their popular book "How To Run A Lathe." A number of changes in text material and illustrations have been made since the previous edition was printed in 1944.

This book contains the latest information on the operation and care of metal working lathes. It covers such subjects as the operation of the lathe units, grinding cutter bits, making accurate measurements, plain turning, chuck work, taper turning, boring, drilling, reaming, tapping, cutting screw threads, reference tables, etc. Written clearly and concisely, it is widely used by machinists, and as a shop text in schools and apprentice training courses. This edition contains 128 pages—5⅛"x8", and over 365 illustrations. Postpaid copies are available with paper covers for 25c (U. S. coin) or with leatherette covers for $1.00. Write to the South Bend Lathe Works, 207 E. Madison St., South Bend 22, Indiana.

Classified Ads

Rate: $2.50 for fifty words or less, 40 cents for each additional ten words or less.

WANTED—Have opportunity for high type experienced service man to take full charge of service in new branch office to be located in Watseka, Ill. T & R Supply Company, Box 587, Kankakee, Ill.

SELLING OUT—USED (As is) and rebuilt Frigidaire and Kelvinator condensing unit, with new S. PH. Capacitator Motors. Write for list. EDISON COOLING CORP., 310 E. 149th St., Bronx, New York City, N. Y.

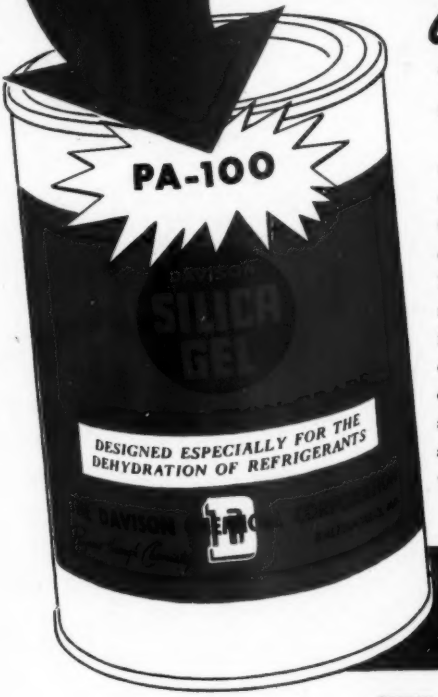
JANUARY *Index to Advertisers* 1948

Gives you DUST-FREE DRYING

For best results on any job...

USE PA-100,

the Preferred Refrigeration Grade SILICA GEL



Give your customers the benefits of Davison PA-100 Refrigeration Grade Silica Gel—the gel that eliminates your moisture problems. Davison PA-100 meets your every requirement—maximum capacity, fast acting, removal of acids and corrosive materials, freedom from caking, freedom from channeling, safe to use, no attack on metals or alloys—and offers the PLUS advantage of *freedom from dusting*.

THE DAVISON CHEMICAL CORPORATION

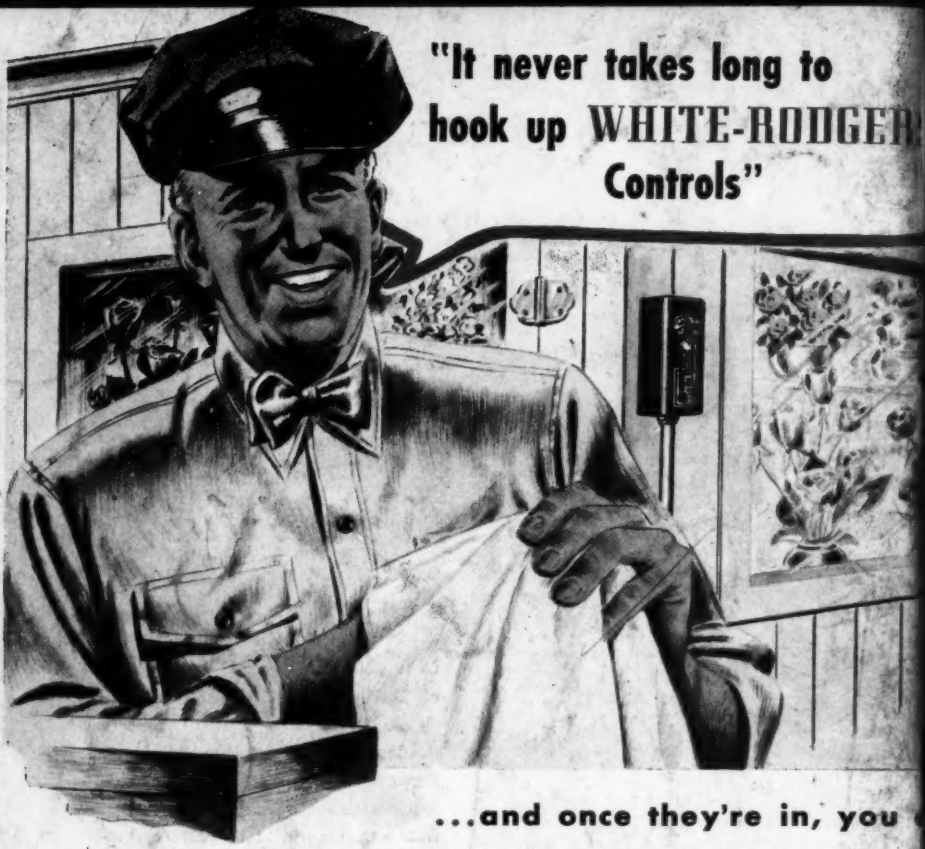
Progress Through Chemistry

BALTIMORE-3, MD.

PIONEERS AND DEVELOPERS OF SILICA GEL

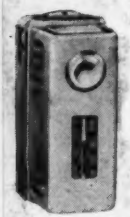
Canadian exclusive sales agents for DAVISON SILICA GEL:

CANADIAN INDUSTRIES LIMITED, Sales Division, Chemical Group



"It never takes long to hook up WHITE-RODGERS Controls"

...and once they're in, you count on them for accurate, dependable performa



Easy to install, easy to adjust — that is why White-Rodgers controls are such big favorites with refrigeration service men everywhere. Mount them at any angle, in any position — they give positive, reliable performance. The visible dials are accurately calibrated in degrees Fahrenheit or pounds pressure and quickly adjusted with only a screwdriver. Nor is waiting or testing necessary — just set the dials and go on to the next job. White-Rodgers Electric Company, St. Louis 6, Missouri.

WHITE-RODGERS

WR Controls

FOR REFRIGERATION HEATING AND AIR CONDITIONING